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BRISTOL BAY RESEARCH

ALASKA DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

ANNUAL MANAGEMENT REPORT

-1985-

BRISTOL BAY AREA

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May, 1986

MEMORANDUM

STATE OF ALASKA

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Date: May 29, 1986

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From: Michael L. Nelson *MLN*
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Subject: 1985 Bristol Bay Annual
Management Report

The attached report represents our continuing and most recent efforts to update and upgrade fishery statistics useful in describing the Bristol Bay salmon and herring fisheries.

Many of the new data tables first included in 1975 have been continued, and the major reorganization of fishery statistics which began in 1981, has been continued with this edition of the Bristol Bay annual management report. I believe this edition will be most useful in explaining and describing management rationale, as well as a better source for compiled catch, escapement and production information on all species of fish harvested in Bristol Bay.

This report is not intended for the general public and is for Inter-Departmental Use Only. It will be distributed only within Department circles with certain exceptions. Please route needed corrections or comments to me here in Dillingham.

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PREFACE

The 1985 Bristol Bay Management Report is the twenty-sixth consecutive annual volume reporting on and detailing management activities of the Division of Commercial Fisheries staff in Bristol Bay. This review emphasizes a descriptive account of the administration of the Bristol Bay commercial fishery resources, as well as outlining management objectives and procedures. Our basic objective in producing this document is to assist in creating a better understanding of the commercial fisheries management program in Bristol Bay.

Extensive reorganization of the documentation in this review, which was begun in 1975, represents our continued efforts to update and evaluate all information deemed necessary to fully explain the rationale behind management decisions formulated in 1985. The extensive set of tables represent our efforts to record material previously unlisted that may be useful and informative. All narrative and data tabulations in this volume are combined under separate SALMON and HERRING sections to aid in the use of this document as a reference source.

Fishery data contained in this report supersedes information in previous reports. This report is considered to be "FOR INTER-DEPARTMENTAL USE ONLY".

Corrections or comments on the contents of this report should be directed to the area office at Dillingham, Attention: Editor.

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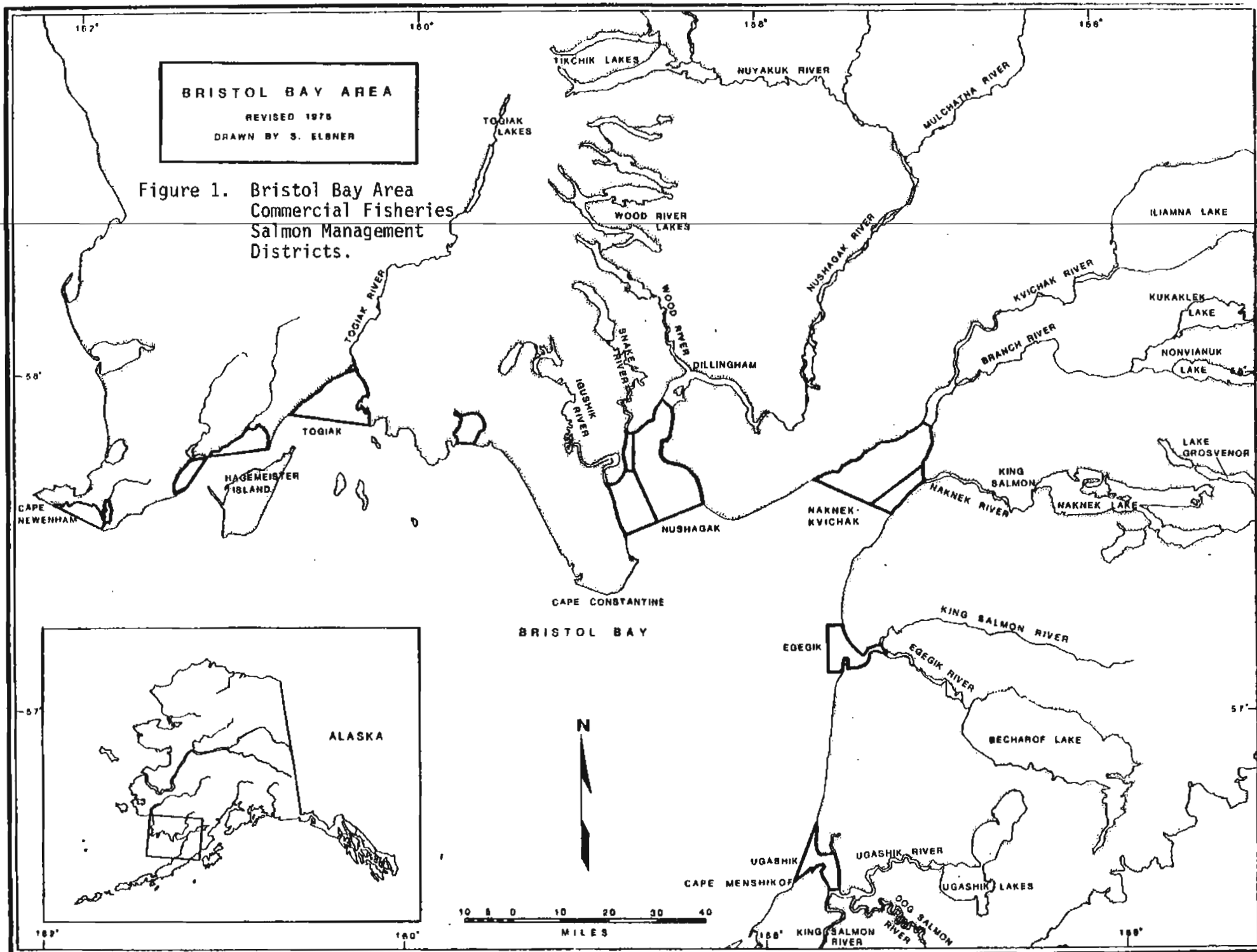


TABLE OF CONTENTS

	<u>Page(s)</u>
I. BRISTOL BAY SALMON FISHERY	
A. INTRODUCTION.....	1
B. FISHERY RUN STRENGTH INDICATORS.....	1
Inshore Preseason Forecast.....	1
Japanese High Seas Fishery.....	3
South Unimak/Shumagin Fishery.....	4
Port Moller Test Fishing Project.....	5
C. FISHERY HARVEST POTENTIAL.....	6
D. FISHERY ECONOMICS AND MARKET PRODUCTION.....	7
E. 1985 COMMERCIAL SALMON FISHERY.....	8
Sockeye Salmon.....	9
King Salmon.....	11
Chum Salmon.....	11
Coho Salmon.....	11
F. 1985 DISTRICT INSEASON SALMON MANAGEMENT SUMMARIES.....	12
Naknek-Kvichak District.....	12
Egegik District.....	25
Ugashik District.....	36
Nushagak District.....	46
Togiak District.....	69
G. 1985 SUBSISTENCE SALMON FISHERY.....	75
H. FIGURES:	
1.—Bristol Bay Area.....	Frontspiece
2.—Bristol Bay Coho Commercial Catch by District.....	13
3.—Lewis Point King Escapement Index.....	49
4.—Nushagak-Nuyakuk Sockeye Daily Escapement.....	53
5.—Nushagak Sockeye Inshore Run by River System.....	62
6.—Nushagak Coho Commercial Catch by Week.....	64
7.—Nushagak Coho Run by Day.....	66
8.—Nushagak Coho Commercial Catch by Year.....	68
9.—Togiak Coho Commercial Catch by Year.....	74
I. TABLES (1985).....	77
1—Sockeye Forecast and Inshore Run.....	78
2—Sockeye Forecast by Age Class.....	79
3—Sockeye Run by Age Class.....	80
4—Sockeye Catch and Escapement.....	81

(continued)

TABLE OF CONTENTS (continued)

Page(s)

I. TABLES (1985) (continued)

5-6—Port Moller Offshore Test Fishing.....	82
7—Naknek-Kvichak District Test Fishing.....	84
8—Egegik District Test Fishing.....	85
9—Nushagak District Test Fishing.....	86
10—King Salmon Test Fishing CPUE.....	87
11—Fishery Announcements.....	89

Salmon Commercial Catch by Period, Species and District:

12—Permit Registration by District.....	101
13—Naknek-Kvichak.....	102
14—Egegik.....	103
15—Ugashik.....	105
16—Nushagak.....	107
17—Nushagak Beaches.....	108
18—Togiak.....	109
19—Togiak Section.....	111
20—Kulukak Section.....	113
21—Matogak Section.....	114
22—Osviak Section.....	115
23—Cape Peirce Section.....	115
24—Total Bristol Bay.....	116
25—Summary Catch by District and Species.....	117

Salmon Escapement by Species and River System:

26—Sockeye Daily Escapement by River System.....	118
27—Salmon Daily Sonar Escapement, Nushagak River.....	120
28—Salmon Aerial Survey Escapements.....	122

Salmon Escapement Summary by River System:

29—Kvichak.....	123
30—Egegik.....	124
31—Ugashik.....	125
32—Wood.....	126
33—Wood Escapement Ocean Age Composition.....	127
34—Igushik.....	128
35—Nushagak/Nuyakuk.....	129
36—Togiak Sockeye.....	130
37—Togiak Sockeye and Coho.....	131
38—Processors and Buyers Operating by District.....	132
39—Case Pack and Frozen/Cured Salmon Production.....	137
40—Salmon Transported Out of Bristol Bay.....	138
41—Salmon Average Weight.....	139
42—Salmon Price Paid and Exvessel Value.....	140
43—Subsistence Salmon Catch by Area.....	141

(continued)

TABLE OF CONTENTS (continued)

	<u>Page(s)</u>
 II. <u>BRISTOL BAY HERRING FISHERY</u>	
A. INTRODUCTION.....	142
Herring/Kelp Fishery.....	142
B. FIGURES:	
1—Togiak Herring Fishing District.....	143
2—Spawn on Kelp Management Areas.....	149
3—Herring Age Composition.....	153
C. TABLES (1985).....	155
1—Biomass Estimates of Herring.....	156
2—Fishing Period Announcements.....	157
3—Herring Catch and Roe Recovery by Period.....	158
4—Biomass and Catch of Herring by Year Class.....	159
5—Herring Catch by Section.....	160
6—Processors and Buyers.....	161
 III. <u>SALMON AND HERRING APPENDIX</u>	
A—Bristol Bay Salmon Management Outlook for 1985.....	162
B—Bristol Bay Sockeye Salmon Forecast Evaluation for 1985....	162
C—Bristol Bay Tide Tables, 1985.....	169
D—Alaska Board of Fisheries Regulatory Action and Management Policy Changes for the 1985 Commercial Salmon Fishing Season, Bristol Bay.....	170
E—Alaska Board of Fisheries Regulatory Action and Management Policy Changes for the 1985 Commercial Herring, Spawn on Kelp and Capelin Fishing Season, Bristol Bay.....	172

ANNUAL MANAGEMENT REPORT
BRISTOL BAY SALMON FISHERY
1985

INTRODUCTION

The Bristol Bay area includes all coastal waters and inland drainages east of a line from Cape Newenham to Cape Menshikof and is the largest sockeye salmon producing region in the world (Figure 1). Bristol Bay also produces substantial returns of other salmon species and the Togiak herring fishery has developed into the State's largest sac roe fishery.

The area wide salmon catch during the 1985 season was 24.6 million fish of all species (Table 25), the tenth largest catch on record. The estimated catch of 144 million pounds was valued at over \$119 million to participating fishermen. Sockeye salmon dominated the commercial harvest, totaled 23.5 million fish, and was the tenth largest catch on record.

The management objectives for all districts in Bristol Bay is the achievement of escapement goals for major salmon species while at the same time allowing for an orderly harvest of those fish surplus to spawning requirements. Sockeye salmon escapement objectives were met in 1985 in all river systems, except the Kvichak River, where spawning requirements have been defined (Table 1). Returns of king, chum and coho salmon were all below expectations, but with extra inseason closures enacted, adequate escapements were achieved.

FISHERY RUN STRENGTH INDICATORS

Inshore Preseason Forecast

A total of 35.0 million sockeye were forecast to return to Bristol Bay in 1985 (Table 1). Generally, returns to east side districts were expected to be moderately high, while returns to west side districts were expected to be low.

Although 1985 should traditionally be a year of peak abundance within the five year Kvichak cycle, returns to this system were expected to be below those observed in both 1983 and 1984 (which should have been years of low and moderate abundance, respectively).

The total projected sockeye salmon harvest for 1985 was 20.3 million (Table 1). Returns were expected to exceed spawning escapement goals for all river systems. The 1985 total run forecast was the weighted average of the results of two independent forecast methods:

1. Standard ADF&G (based upon spawner-recruit relationships, sibling age class returns, and smolt production-survival estimates for individual age classes and river-lake systems), and
2. Japanese Gill Net Catches (based upon immature sockeye salmon arithmetic mean catch per unit of effort reported by Japanese research vessels fishing south of the Aleutian Islands during summer months).

These methods produced the following results, which in turn, were pooled to produce a final weighted composite forecast (in millions of fish:)

Method	Estimate	Std. Dev.	80% C.I.
Standard ADF&G	25.3	11.3	9.8 to 39.6
Japanese Gill Net Catches	41.9	9.4	28.9 to 54.9
Composite Weighted Average	35.0	6.8	26.0 to 44.0

Much larger 1985 returns were predicted by the spawner-recruit component of the standard ADF&G method than from either the sibling age class or smolt components. This was particularly evident for the Kvichak system which was predicted to contribute about 50% of the total 1985 run (Appendix B). The spawner-recruit relationship (based upon the 1980 spawning escapement of 22.5 million) predicted a 1985 return to the Kvichak system in excess of 20.0 million sockeye salmon. However, this prediction was not supported by the low age 4(3) 1984 return to the Kvichak system of siblings from the 1980 brood year (13,000

sockeye salmon), which indicated a return of only 2.3 million age 5(3) sockeye salmon in 1985. Therefore, while the progeny of the large 1980 spawning escapements may constitute over 70% of the total 1985 return, their abundance in 1985 may be less than that forecasted by the standard ADF&G method (Appendix B).

The standard ADF&G forecast was about 20% greater than the Japanese gill net catches forecast. Differences between the two estimates were mostly due to differences in predictions for 3-ocean (age 5(2) and 6(3)) sockeye salmon returns. The standard ADF&G method gave an estimate for 3-ocean returns (12.2 million) which was 37% greater than the Japanese gill net catches estimate (8.9 million), while predictions for 2-ocean returns were very similar for both methods (standard ADF&G, 21.2 million, Japanese gill net catches, 19.0 million).

In summary, the return of sockeye salmon to Bristol Bay in 1985, which should have been a peak year in the traditional five year Kvichak system cycle, was expected to be less than that observed in either 1983 or 1984. Additionally, low 1984 returns of siblings (jacks), particularly to the Kvichak system, from the extremely large 1980 spawning escapements suggested that actual 1985 returns may even be less than forecasted abundance (Appendix B).

Japanese High Seas Fishery

Since 1974 the Japanese high seas mothership gill net fishery has seen a decreased high seas exploitation rate of Bristol Bay sockeye, brought on by bilateral negotiations between Japan and the United States and through renegotiation of the INPFC treaty. The high seas mothership catches were again reduced in 1985 due to area/time restraints, as well as a late start for the fleet, which was the result of a negative impact of fishery negotiations with the U.S.S.R.

The mothership high seas gill net preliminary catches in 1985 amounted to:

Sockeye	- 1.1 million (compared to 1.6 million in 1984)
King	- 66,000 (lowest in last 20 years)
Chum	- 2.8 million (very low)
Pink	- 2.7 million (catch rate down)
Coho	- 128,000 (lowest since 79,000 in 1977)
Total	- 6.9 million (lowest in last 20 years)

A significant commercial harvest of 1 to 5 million coho salmon is taken annually on the high seas by the Japanese mothership and land-based gill net fleets. The continent of origin of these coho are largely unknown, but a cursory evaluation of recent catch data suggests that there may be a direct relationship between coho salmon catches by the Japanese mothership fleet and Bristol Bay commercial catches in the same year.

South Unimak/Shumagin Fishery

The South Unimak/Shumagin cape intercept fisheries landed over 1.8 million sockeye salmon of North Peninsula/Bristol Bay origin in 1985. The inseason development of the Unimak/Shumagin June cape intercept sockeye fishery is closely monitored by Bristol Bay fishery managers because this fishery can be helpful in showing migration timing, relative abundance, age composition and fish size of the incoming Bristol Bay run. These intercept fisheries were again managed under a guideline quota harvest policy originally adopted in 1974 by the Alaska Board of Fisheries to prevent over harvest of sockeye runs to individual river systems in Bristol Bay.

The early-season South Unimak/Shumagin fishery catch rates suggested a "normal" run timing and a run of some strength and breadth (strong catches from June 12 through June 23). Analysis of catch sampling efforts at South

The salmon canning industry made all of the Bay's available canning lines operational, which numbered 11 1-lb. talls, 18 1/2-lb. flats, and 2 1/4-lb. flats in 10 plants (Table 38). In addition to the land-based canning operations, 49 companies operated in the Bristol Bay area in 1985 in the fresh export, brine or refrigerated sea water (RSW) export, frozen and cured salmon marketing areas (Table 38). A total of 59 processors/buyers reported catches in Bristol Bay in 1984 and 1985 compared with 62 in 1983 and 72 in 1982.

Even though 1985 saw high daily salmon catches no harvest was lost due to processor limits or suspensions. Post-season analysis showed that daily sustained processing production in 1985 amounted to 1.3 million fish for 16 days from June 27 through July 12, compared with 1.2 million fish in 1984 and 1982, 2.1 million in 1983, and 1.6 million in 1981.

FISHERY ECONOMICS AND MARKET PRODUCTION

Unlike previous seasons, when price disputes delayed or tied up virtually the entire fishery until an agreement was reached, one major fishermen's group, the Alaska Independent Fishermen's Marketing Association (AIFMA), concluded a three-year (1983-85) price agreement with processors which ties the final price to the value of the product for the preceeding year. The other major fishermen's association, Western Alaska Cooperative Marketing Association (WACMA), concluded price agreements in June of 1985, and as a result, the early spring of 1985 was devoid of a "price war" for the third consecutive year.

Final fish prices in 1985 have yet to be determined, however, AIFMA association began with a base price of 75% of 1984's final price for sockeye, chums and kings, and tied the final price to the value of the product from August, 1985 through March 15, 1986. The other major association (WACMA) agreed upon a base price of \$.85 to \$.665 for fresh/frozen and canned sockeye and coho,

respectively, and \$.28 for chums, and tied the final price to the value of the product. Exvessel value (or value to the fishermen) of the 1985 Bristol Bay salmon fishery harvest, as established from Department records, was \$119.2 million (Table 42).

The increasing trend of salmon production in the frozen/cured processing category continued in 1985. Frozen salmon production in Bristol Bay totaled 95.6 million pounds of all species in 1985, up significantly from 1984 (74.7 million pounds). In spite of the heavy daily sockeye production in 1985, there was a dramatic decrease in canned production over previous years; however, the shift in emphasis from canning to frozen and fresh markets accelerated rapidly and is shown below by comparing the percent of total Bristol Bay production of all species by product types since 1978:

Type of Production	Percent of Total Production							
	1978	1979	1980	1981	1982	1983	1984	1985
Canned	63	36	34	38	15	21	38	16
Frozen/Cured	12	32	27	36	61	53	47	71
Fresh Export	9	18	18	13	21	14	6	9
Brine/RSW Export	16	14	21	13	3	12	9	4

1985 COMMERCIAL SALMON FISHERY

All five species of Pacific salmon are found in Bristol Bay and are the focus of commercial, subsistence and sport fisheries. The sockeye salmon run is the most significant, but there are also important runs of king, chum, coho, and in even-years, pink salmon. Numerically, based on 20 year data (1965-84), the average annual commercial catches are as follows: 12.8 million sockeye salmon; 125,000 kings; 862,000 chums, 148,000 cohos; and 2.0 million even-year pink salmon. Subsistence catches average approximately 150,000 salmon per year; mostly sockeye, while sport fisheries operate to varying degrees of intensity on all species of salmon, with most effort directed toward king and coho salmon stocks.

Sockeye Salmon

This year's sockeye run timing (mid-point) based on Fisheries Research Institute (FRI) Adak/Cold Bay air temperature analysis was July 3 for Naknek-Kvichak and July 4-5 for Nushagak, and FRI further suggested that fishery management personnel plan for a "normal" run timing. It appears from preliminary analysis that both the Naknek-Kvichak and Nushagak districts peaked on July 5-6, a day or two later than suggested. The approximate midpoint of the Bristol Bay incoming run, based on actual catch and escapement, was July 5. The early-season South Unimak/Shumagin fishery catch rates also suggested a "normal" run timing.

The sockeye salmon return to Bristol Bay in 1985 totaled 36.6 million, virtually identical to the preseason forecast of 35.0 million (Table 1). Sockeye returns to the Egegik and Ugashik districts were about 30% above forecast, while those to the Nushagak and Togiak districts were 35% and 70% below forecast, respectively. The Naknek-Kvichak district return of 17.3 million fish was as expected.

The sockeye salmon catch of 23.5 million was the tenth largest in the 93 year history of the fishery with all time record catches in the Egegik and Ugashik districts. Sockeye escapements were achieved in all systems with the exception of the Kvichak River where the escapement of 7.2 million fell nearly 3 million short of the goal (Table 1).

The wide disparity between sockeye returns to east vs. west side river systems was notable, and a close examination of return per spawner records pretty well shows why (at least for the west side systems). Over-escapements (due to the 1980 price dispute), plus poor spawning ground distributions (in Wood, Igushik

and Nuyakuk) was probably the primary factor. The 1980 brood year escapements and eventual returns are shown below:

River	In Millions		
	1980 Esc.	Total Return 1/	Return/Spawner
Kvichak	22,505	12,113	0.54
Naknek	2,645	3,213	1.21
Egegik	1,061	7,233	6.82
Ugashik	3,335	6,484	1.94
Wood	2,969	1,551	0.52
Igushik	1,988	274	0.15
Nuyakuk	3,027	656	0.22
Togiak	527	335	0.64

1/ Does not include 6 yr. fish, all 1985 catches are preliminary.

Actual returns of sockeye compared to forecasted returns in 1985 are presented by river system below:

River System	In Millions of Fish		
	Forecasted Return	Actual Return	Percent Error
Kvichak	12.2	13.4	10%
Naknek	4.9	3.7	76%
Egegik	6.6	8.6	30%
Ugashik	5.6	7.4	31%
Wood	2.3	1.7	74%
Igushik	0.3	0.4	28%
Nuyakuk	1.7	0.7	41%
Togiak	0.9	0.4	42%
Total	35.0	36.6	5%

Sockeye escapement preseason goals were obtained or closely met in all major manageable systems except Kvichak River, where the escapement was 7.2 million, or 72% of the preseason goal (Table 1). The total Bay sockeye run in 1985 was 5% above forecast, compared with the 20 year average forecast error of 45%.

King Salmon

The total commercial catch of 121,000 king salmon was equal to the 20 year (1965-84) average, but was 21% lower than the recent 10 year (1975-84) average (Table 25). Escapement requirements were met in Nushagak district, the only system with a defined escapement objective (50 to 100,000). The Nushagak king run demonstrated a "holding pattern" within the district until June 29-30, and backed right into the incoming sockeye run. With the use of extensive fishery closures, and a restriction on the use of large mesh king gear, the district escapement reached 116,000. Of significance to future runs, 34% of the Nushagak return were age 4(2) jacks, indicating good survival of the 1981 brood year escapement of 150,000 and the potential for excellent production in 1986 and 1987. Both the Nushagak and Togiak total king returns (183,000 and 52,000, respectively) were virtually identical to the preseason forecasts (179,000 and 53,000). The Togiak king escapement of 14,000 was slightly below the long-term average of 18,000.

Chum Salmon

The total commercial catch of 863,000 chum salmon was identical to the previous 20 year average, but well under the past nine years when production has been high. Escapements to the Nushagak and Togiak systems were 288,000 and 212,000, respectively, both adequate when viewed with the provisional escapement goal of 200,000 for both systems.

Coho Salmon

Commercial interest in the Bay's coho runs is continuing, and as this interest and fishing effort expands, the Department will need to develop inseason escapement techniques to manage this resource. The total commercial catch

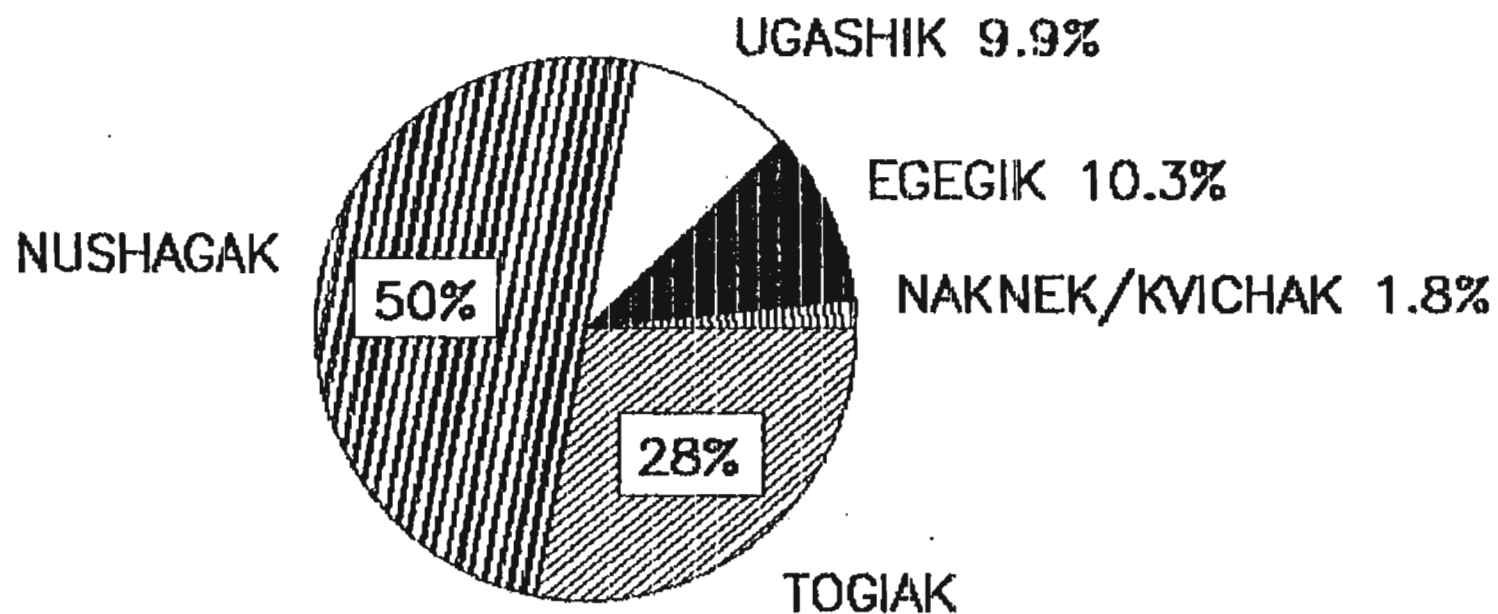
amounted to 161,000, pretty well divided between the four major coho fishing districts (Table 25). The Nushagak district, which produces over 51% of the Bay's cohos, was closed on July 30 and did not reopen due to the weak run (Figure 2). This district is the only system where the Department has a method (sonar) to measure inseason escapement. Escapement past the Nushagak sonar site was 90,000 cohos, and with a catch of 20,000, equaled a total run of 110,000. The provisional escapement goal (150,000) was not met in Nushagak, although we consider the escapement, which was 82% of total run, as being adequate. Minimal fishing time was allowed at Togiak, and the Egegik-Ugashik area saw a reduced fishing schedule (for the first time) in an effort to increase escapement rates. This year's poor coho return was not unexpected, as both the Japanese mothership coho catches, joint U.S.-Russian tagging and the Popoff Head-Shumagin domestic catches all suggested a poor run. Aerial surveys were conducted in the Togiak, Egegik, and Ugashik districts, and the survey indices indicated escapements of 61,000, 5,000, and 21,000, respectively.

1985 DISTRICT INSEASON SALMON MANAGEMENT SUMMARIES

Naknek-Kvichak District

The 1985 run to the Naknek-Kvichak district was 17.3 million sockeye, almost identical to the preseason forecast of 17.5 million (Table 1). The Kvichak River run of 13.4 million was 10% above forecast while the Naknek and Branch River runs were 24% and 44%, respectively, below preseason forecasts. Escapement goals for 1985 were 10.0 million for the Kvichak River, 1.0 million for the Naknek River, and 185,000 for the Branch River. Actual escapements were 7.2 million to the Kvichak, 1.9 million to the Naknek, and 118,000 to the Branch. Age class 5(3) sockeye was forecasted to be 57% of the Naknek-Kvichak run while the actual return consisted of 52% 5(3) (Table 3).

Figure 2. COHO SALMON COMMERICAL CATCH
PERCENT BY DISTRICT
1977 - 1985 AVERAGE



Preseason management strategy called for a conservative approach to commercial fishing periods in the Kvichak section in response to a projected harvest of only 2.2 million sockeye from the Kvichak run. The Naknek forecasted harvest of 3.9 million called for a more liberal approach in that section.

South Unimak and Shumagin Island catches were low the first two openings on June 3 (9,000) and 5 (21,000) due to very poor weather conditions. A period on June 7 produced good catches (83,000) under good weather conditions. A fourth fishing period for South Unimak alone on June 9 produced a catch of 79,000, and weather conditions were relatively poor. The June 12-18 weekly quota at South Unimak was caught in two days with a harvest of 200,000 on June 12 and 389,000 on June 14. Age class composition from the catches through June 12 showed only slight differences from the pooled Bristol Bay forecast with the 2-ocean age classes slightly below forecast and the 3-ocean age classes slightly above forecast.

The Port Moller test fish program began on June 10 and sockeye catches rose gradually until June 15 when the indices nearly doubled the previous days (Table 5). Age class composition of test catches through June 15 were heavier on both 3-ocean age classes than forecast and lighter on both 2-ocean age classes. Catches continued to climb dramatically for the next two days (June 16-17).

The next weekly period at South Unimak and the Shumagin Islands began on June 19 with a 16 hour fishing period. Catches were strong (Unimak-182,000 and Shumagin-53,000) despite a strong onshore wind. Port Moller, meanwhile, dropped off significantly on June 18 through 20. Estimated passage past Port Moller through June 20 was just over 3 million sockeye based on the size/catchability relationship (Table 5). Inshore data was still not sufficient enough to utilize the lag time relationship. Sockeye test catches again climbed on June 21-22,

Unimak/Shumagin's indicated a closer fit with the ADFG standard forecast than with the pooled. A comparison of preliminary age data from all collection points is shown below:

Category	Age Class in Percent					
	4(2)	5(3)	2-Oc	5(2)	6(3)	3-Oc
<u>ADFG Forecast</u>						
Standard	12	37	49	27	24	51
Pooled	17	52	69	16	15	31
South Unimak/Shumagin's 1/	14	30	44	42	12	54
<u>Port Moller Test. Catch</u>						
	12	41	53	29	16	45
<u>Bristol Bay</u>						
Catch	12	43	55	30	15	45
Escapement	14	47	61	22	17	39
Total Run	13	46	59	25	16	41

1/ Mixed purse seine/gill net.

A new inseason forecast method based on the sockeye and chum catch in the South Unimak/Shumagin fishery was issued on June 23 this season and totaled 33.8 million, only 8% below the actual return. This relationship shows much promise and could go a long way toward supplanting the Port Moller test fish operation if budget constraints prohibit the operation of this program in the future.

Port Moller Test Fishing Project

The Department's Port Moller test boat provides information on sockeye and chum salmon run timing and magnitude and age and size composition of the incoming run one week in advance of the inshore fishery.

Port Moller test fishing information again produced conflicting estimates of both sockeye salmon run timing and size this season. Sockeye catches indicated that the run would probably exceed preseason expectations. However, as in 1984, estimated travel time of sockeye between the Port Moller transect and inshore fishing districts was difficult to determine, and this made run size difficult to estimate. Lag time was estimated at 8 to 12 days between June 27 and July 6, and this analysis indicated that the total run would be greater than the pre-season forecast estimate (Table 5). Actual lag time between Port Moller and the inshore fishing districts, as determined by post-season analysis, was 7 days.

Continuous age composition sampling from the initiation of sampling at Port Moller on June 10 indicated that all major sockeye age classes were running virtually identical to the ADFG standard preseason forecast. The ability to accurately predict the age composition of the inshore sockeye return early in the season has continued potential for inseason evaluation of the forecast, and helps to point out where forecast run magnitude may be in error.

FISHERY HARVEST POTENTIAL

Other than sockeye and Nushagak and Togiak king salmon, formal total run forecasts for other salmon species returning to Bristol Bay are not generally published because long-term escapement data are limited for these species. However, catch projections are put together based on relative estimates of parental run size, average age composition data, and recent relative productivity patterns. Catch potential and actual harvests for all species in 1985 were as follows:

Species	Harvest in 1,000's of Fish	
	Potential	Actual
Sockeye-----	20,293	23,474
King-----	150	121
Chum-----	1,000	863
Coho-----	150	160
Total	21,593	24,618

12 hour fishing period extension for the Naknek section was announced after examination of all escapement trends. Inside test fish indices in Kvichak River were again strong on both banks on the evening tide.

The commercial fishery was allowed to close at 7:00 a.m., June 29 in order to assess catch and escapement information. The estimated catch for the 24 hours of fishing was just under 1.6 million (Table 13). The morning test fish indices on Kvichak River were very high with over 2,000 index points on the west bank and over 8,000 on the east. An aerial survey of the river in the afternoon of June 29 gave an estimated 1.2 million escapement (Table 29). Port Moller test fish showed the largest daily index of the year on June 28 (216 index points), and estimates of sockeye salmon passage ranged from 16.7 million with a lag time of 11 days to 45.9 million with a lag time of 13 days (Table 5). The Naknek River sockeye escapement had reached 467,000 by 2:00 p.m., June 29, nearly 50% of the goal, while the Kvichak River escapement had reached 250,000 with an additional 1.2 million in the river (Table 29). With the encouraging escapement trends and total run strength indicators, a 12 hour fishing period for the entire district was announced to start at 8:00 a.m., June 30 (Table 1).

The Port Moller sockeye index catch for June 29 was 185 and the estimate of 32.5 million past the project was based on an 11.5 day lag time (Table 5). The Kvichak River sockeye escapement through June 29 was slightly lower than forecast in age 5(3) and slightly larger in the 6(3) age class. An aerial survey of the commercial opening on June 30 showed poor to fair catches on the west side and only moderate catches on the east side of the district. The Naknek escapement through 2:00 p.m., June 30 was 510,000, over one half of the escapement goal. The Kvichak escapement was 495,000 with an additional 1.2 million in the river (Table 29). Inside test fish indices in Kvichak River remained strong the first

tide of June 30 with indices of over 7,000 on the west bank and over 4,000 on the east. Fishing time was extended in the Naknek section an additional 12 hours and set net fishing only was allowed in the Kvichak section for an additional 12 hours (Table 11). It was felt that the drift fleet would be detrimental to the Kvichak escapement if allowed to fish while the set net fishery would not.

An aerial survey of the Kvichak River the evening of June 30 produced an estimate of 1.1 million and coupled with the tower escapement gave an estimated total escapement of 1.7 million (Table 29). The Kvichak inside test indices were still strong the evening tide of June 30, but dropped off dramatically the first tide on July 1. Port Moller again had a high index catch on June 30 (188 index points) and 30.0 million sockeye were estimated to have passed the project site based on an 8 day lag time (Table 5). It was fairly obvious at this time that an accurate lag time would be difficult, probably because of the holding and milling pattern of the fish inshore. The Naknek River escapement reached 582,000 by 2:00 p.m., July 1, five days ahead of the long-term average. A 12 hour fishing period was announced for the Naknek section coupled with set net only in the Kvichak section to begin at 10:00 a.m., July 2 (Table 11).

Age class comparisons were analyzed to estimate the interception rate of Kvichak sockeye that were being caught in the Naknek section. Preliminary results of this comparison showed that about 64% of the sockeye catch from the Naknek section were of Kvichak River origin. A detailed scale analysis post-season showed a 90% interception rate. Because of this interception rate, the fishing period was extended in the Naknek section only and for set net only for an additional 24 hours in order to harvest excess Naknek River fish (623,000 escapement through 6:00 p.m., July 2), while protecting Kvichak fish (an estimated 1.3 million escapement). Aerial survey conditions on the Kvichak River were extremely poor on July 2 and an accurate estimate was not possible. Kvichak inside test

and the estimated passage through that date was 3.9 million (Table 5). South Unimak and the Shumagin Island catches on June 21 were very strong (258,000 and 62,000, respectively) under good morning weather conditions and poor afternoon conditions. Catches prior to June 22 had been strong in both the Egegik and Ugashik districts with average catches of 730 sockeye per delivery at Egegik and 520 per delivery at Ugashik (Table 14 and 15). The Naknek-Kvichak catch stood at 135,000, less than the long-term average by this date (Table 13). The Kvichak inside test fish program began on June 22, and catches from 18 drifts from June 22-26 totaled only 3 fish (Table 29). A district outside test fish boat was sent out on June 26 and confirmed that fish were present in good numbers in the district especially on the east side (Table 7).

All factors pointed to a milling and holding pattern inside and outside the district with very little movement up the rivers. Fishing would not be allowed until fish began their upriver movement. The Port Moller test boat made fair catches on June 23 but was unable to fish June 24 due to bad weather conditions. The estimate past Port Moller through June 24 was 4.8 million sockeye salmon. Age class composition at Port Moller continued to be lower on 2-ocean and higher on 3-ocean than that of the forecast. South Unimak fished their last period of the season on June 23 and made good sockeye catches (333,000). Several reports were received on June 25 of many jumpers in the district and near the mouth of the Naknek River.

The Egegik inside test fish project made its first large catch the morning of June 26, while an aerial survey was flown of the Naknek River the afternoon of June 26 with negative results. There continued to be many reports of jumpers everywhere in the district and at the mouth of the Naknek River.

The Kvichak inside test index nets made the first large catch on the early morning tide of June 27, especially the net sites on the east bank. The sockeye catch consisted of a large number of water marked males while the females were much fresher. Naknek tower counts rose dramatically beginning about 6:00 a.m. with over 9,000 sockeye per hour passing the site. Travel time from the district to the Naknek counting tower site was between 20 and 24 hours. Another aerial survey was conducted of both the Naknek and Kvichak Rivers the afternoon of June 27. Heavy numbers of sockeye migrating up Naknek River were observed from muddy water all the way to the tower. Fish were fairly heavy in the Kvichak River (158,000) from muddy water upstream to No-See-Um Lodge. With the increased escapement rate in Naknek River the Naknek section was opened to fishing for a 12 hour period beginning at 7:00 a.m. on June 28 (Table 11).

Port Moller catches continued strong on June 25-27 with passage estimated to be 6.3 million sockeye using size/catchability and 8.0 million using a lag time of 10 days (Table 5). Age class composition sampling continued to show a smaller percent of 2-ocean and larger percent of 3-ocean than forecast. The Kvichak inside test indices on the afternoon tide of June 27 were even stronger than the morning tide indices, while 350-400,000 fish were estimated to have escaped in the Naknek River before the commercial fishery would take effect on June 28.

Heavy fog prevented aerial surveillance of the commercial opening until 1:00 p.m. Catches were estimated to be 1,200-1,500 per boat with a total catch of just over 1.0 million. The Kvichak River was flown at 2:00 p.m. and the aerial survey method produced an estimated 484,000 fish in the river (Table 29). The Kvichak inside test indices were again strong on both banks on the morning tide of June 28, while the Naknek River tower count through 2:00 p.m. was 316,000. A

indices remained low until the evening tide of July 2 when they began to increase. Port Moller indices dropped off significantly on July 1-2, while commercial catches had reached 4.2 million sockeye through this date.

The Naknek River escapement reached 703,000 by 6:00 p.m., July 3, still four days ahead of the long-term average, while Kvichak River escapement through the same time period was 1.3 million past the tower and an undetermined amount in the river. (The inside test fish project was estimating a total escapement of 1.4 million). Muddy conditions in the Kvichak River precluded an aerial survey on July 3.

It appeared that most of the interception of Kvichak sockeye was taking place in the channel just off of Pederson Point. In order to reduce interception of Kvichak fish and still harvest excess Naknek sockeye stocks, the set net fishery in the Naknek section was extended an additional 24 hours and the drift fleet was allowed a 12 hour fishing period beginning at noon, July 4 in a reduced Naknek section (Table 11). The new northern boundary for drift net fishing was established at Loran C line 32370 which runs westerly from Naknek Point. This reduced section would hopefully cut down on Kvichak interception by eliminating the triangle where most of the suspected interception was taking place. Special scale samples would be taken from the drift fleet and from three distinct areas of beach - the South Naknek beach, Naknek Point to Pederson Point, and Pederson Point to Libbyville.

The fishing period was allowed to close on schedule at noon, July 5 in order for catch samples to be processed and further catch and escapement information to be gathered. Kvichak inside test sockeye indices picked up significantly on the evening tide of July 3, but began dropping off again on July 4. The test fish project was estimating an escapement of 2.1 million through July 5, while the Kvichak River escapement through 10:00 a.m., July 5, at the tower site,

was 1.7 million, with an additional 149,000 in the river based on aerial survey enumeration techniques. The Naknek River sockeye escapement had reached 755,000, 76% of escapement requirements (Table 29).

Based on age composition samples Kvichak sockeye salmon interception from beach areas were estimated to be 68% from South Naknek beaches and 82% from North Naknek beaches, while post-season results using detailed scale analysis procedures showed similar results. The drift gill net harvest was estimated to be composed of 71% sockeye of Kvichak River origin. Aerial surveys of the Kvichak River on July 6-7 produced estimates of 166 and 175,000, both under fair to poor survey conditions. The actual escapements were probably 4 or 5 times these estimates (Table 29). The inside Kvichak test fish project was projecting 3.2 million escapement through July 7 while the tower count was 2.7 million. The Naknek River escapement had reached 1.0 million by July 7 and escapement requirements in this river were now achieved (Table 24). Port Moller's last day of test fishing was July 6, and the sockeye estimate past the site was just over 43 million fish based on a 10 day lag time (Table 5).

An outside test boat was sent out on July 6, but catches showed little buildup except at the mouth of the Naknek River and at Low Point (Table 7). Two test boats were dispatched into the large Naknek-Kvichak district on July 7, and the extended district coverage showed fair to good catches in most locations, including Salmon Flats and Gravel Spit on the west side (Table 7). Another test boat was sent out on the early tide of July 8 and catches showed strong fish movement off Pederson Point and at Cutbank (Table 7). Indications on July 7 showed that a large push of fish on the south Egegik line was taking place, and many reports were received of jumpers at the mouth of the Naknek River. A 12 hour fishing period for drift fishing in the Naknek section and set net fishing in the entire district was announced to begin at 4:00 p.m., July 8 (Table 11).

An aerial survey of the Kvichak River on July 8 produced a formula estimate of 456,000 sockeye in the river, although the survey was flown under poor survey conditions (Table 29). A visual estimate based on strength in areas which could be counted showed 1.5 million in the river. Port Moller indices 7-10 days earlier had been high and these fish would be expected to be entering the Bay at this time. Kvichak inside test fish indices had increased on both July 7 and the first tide of July 8. The Naknek escapement had reached 1.3 million with over 315,000 from midnight to 6:00 p.m., July 8. An announcement for a 12 hour extension on the current period was announced based on the encouraging run strength indicators. The Naknek River sockeye escapement continued to climb, and through 10:00 a.m., July 9, was nearly 1.5 million and above the upper management range of 1.4 million. Kvichak inside test catch indices dropped the morning tide of July 9, and through July 8 test catch indices indicated an escapement of just over 4.0 million past the project site (Table 29). Another 12 hour fishing period extension was announced so that fishing would continue through 4:00 a.m., July 10 (Table 11). An aerial survey under poor light conditions the evening of July 9 produced an estimate of 1.5 million fish in the Kvichak, however, based on personal observation the estimate was closer to 2.5 million. The tower count and river estimate resulted in a total Kvichak escapement estimate of 6.1 million sockeye through 6:00 p.m., July 9 (Table 29). A 14 hour extension was announced at 9:00 p.m. for fishing to continue until 6:00 p.m., July 10 (Table 11).

The Naknek River escapement through 10:00 a.m., July 10 was over 1.5 million, while the total Kvichak escapement was estimated to be 6.8 million, and the inside test fish project was estimating 5.2 million through July 9 (Table 29). An announcement for 24 additional hours of drift net fishing in the reduced Naknek section and set net fishing in the entire Naknek section was made at

noon, July 10 (Table 11). Again special efforts would be made to collect scale samples from various catch areas. Set net fishing in the Kvichak section was allowed to close to protect Kvichak River stocks.

The Kvichak inside test project was estimating 6.1 million sockeye escapement through July 10, however, indices were down on the morning tide of July 11. The Naknek escapement had been curbed by the fishery and was down to an hourly passage rate of less than 600 fish. An aerial survey of Kvichak River on the evening of July 10 produced an estimate of 900,000 fish (Table 29). Apparently, the aerial survey estimate made on July 9 had been high, probably due to large fish, large deep schools in the lower river, and the less than ideal visibility conditions. A 25 hour extension was announced for the current fishing period.

Results of the age analysis from the various catch areas gave similar results to those taken earlier. The estimated Kvichak River sockeye interception rates were 74% in the Pederson Point to Libbyville area, 93% in the drift fleet, and 68% in the beach catches south of South Naknek. Inside test fish indices continued at a low rate through July 11, and the total estimate of escapement in Kvichak River through that date was 6.2 million (Table 29). An aerial survey the evening of July 11 showed 623,000 fish in the river, and with an escapement past the tower of 5.2 million gave a combined escapement estimate of 5.8 million, far short of the 10 million goal. In order to protect as many Kvichak fish as possible, the entire district was closed to fishing, and the escapement in the Naknek River was allowed to exceed the management range.

A district test fish boat was dispatched July 13, and fair catches were made off the Naknek River mouth and near Cutbank, but catches in other areas were relatively poor (Table 7). The inside Kvichak test indices remained low on July 13 but began to pick up on July 14. Another district test fish boat was

sent out July 14 and, except for a fair catch on the outer district line, made poor catches (Table 7). Aerial surveys of the Kvichak River on July 12-14 produced similar estimates of 319,000, and 234,000 fish respectively (Table 29). The daily tower counts for the same three days were 473,000, and 299,000, respectively (Table 29). The total estimated escapement through 2:00 p.m., July 14 was 6.5 million sockeye, while the inside test fish project was estimating 7.1 million fish through July 14 (Table 29). The Naknek River escapement was monitored hourly in order to detect any huge increase in that system, however, no large rate increases were noted and the daily counts for July 12, 13, and 14 were 32, 26, and 57,000 respectively, bringing the total escapement to nearly 1.7 million through July 14.

An announcement was issued that continued the closure in the Kvichak section until 9:00 a.m., July 22, and that opened the Naknek section for drift net fishing in the reduced section and set nets in the entire section until 9:00 a.m., July 20 (Table 11). An aerial survey of the fishery, however, showed the fleet concentrated in the area where significant numbers of Kvichak fish would be expected to be intercepted, and the Naknek fishing period was subsequently closed after only 12 hours. The commercial sockeye catch during the 12 hour period was 69,000 fish.

Thought was given to extend the closure of the district beyond July 22, but a search of historical data showed that a catch of less than 100,000 sockeye could be expected through the remainder of the season. A district test boat was sent out on July 20 and except for one drift near the Cutbank, had extremely poor catches (Table 7). The fishery was allowed to open at 9:00 a.m., July 22 and a total of 210,000 sockeye were harvested during the remainder of the season (Table 13).

The final Kvichak escapement was 7.2 million, 72% of the escapement goal. The Naknek escapement was 1.9 million, 185% of the goal and 29% above the upper management range. The Branch River escapement of 118,000 was 64% of the goal. Age class composition of the Kvichak sockeye return and the Naknek return was higher in the 3-ocean component and lower in the 2-ocean component. Illustrated below is a comparison of ages of the sockeye returns (R) and the forecast (F):

	Age Class in Percent											
	4(2)		5(3)		2-Oc.		5(2)		6(3)		3-Oc.	
	R	F	R	F	R	F	R	F	R	F	R	F
Kvichak R.	6	8	58	64	64	72	11	10	25	18	36	28
Naknek R.	21	22	31	41	52	63	37	21	10	16	47	37
N-K Dist.	9	12	52	57	61	69	18	14	21	17	39	31

The commercial sockeye salmon catch was 8.1 million, 28% above the preseason forecast of 6.3 million, and this catch was the second lowest since 1979 but above the 20 year average to this district.

Commercial catch of other species were 6,000 kings, 176,000 chums, and 8,000 coho (Table 13). Pinks are negligible in odd years in Bristol Bay, while king and chum catches closely paralleled 20 year average catches for these species, while the coho catch was nearly three times the 20 year average.

A total of 45 processors and buyers operated in the Naknek-Kvichak district in 1985 (Table 38). Production included 26.9 million pounds frozen, 400,000 pounds cured, 3.8 million pounds flown out fresh, 1.5 million pounds exported by sea, and the remainder canned (Tables 39 and 40). No production was lost due to excess amounts of fish or price disputes.

Subsistence catches in the Naknek-Kvichak district totaled 110,000 salmon during 1985 (Table 43). There were no problems reported from any area with regards to obtaining subsistence quotas. A total of 544 permits were issued,

up nearly 200 from the previous three years. All Alaskan residents were eligible for permits in 1985 as opposed to only local residents being eligible the previous three years. The personal use fishery on the Naknek River was eliminated in 1985.

Egegik District

The 1985 sockeye salmon run to the Egegik district totaled 8.6 million fish, a new total run record for the district (previous high was 7.5 million in 1983), exceeding the preseason forecast of 6.6 million by 30% (Table 1). The 1985 run yielded the largest harvest on record (7.5 million) and an escapement of 1.1 million (Table 1). The escapement was 10% greater than the 1.0 million fish point goal but well within the desired range of 0.8 to 1.2 million. Total sockeye returns during comparable cycle years dating back to 1955 have ranged from 0.9 to 4.6 million with a mean of 2.8 million, so the 1985 return ranks as the largest on record and was three times the long-term cycle year average.

The preseason Egegik forecast indicated 5.6 million sockeye would be available for harvest, the second largest harvest in the history of the fishery (Table 1). Consequently, a great deal of preseason interest in the management of the district was evident from both the fishing and processing sectors. To some the forecast generated anticipation of a liberal approach to fishing time and harvest, while others were concerned that a smaller than usual peak year harvest forecast for the Kvichak district (2.2 million sockeye) would cause more fishing effort to shift to Egegik, leading to fewer and shorter fishing periods. A new regulation adopted for the 1985 season allowing fishermen to transfer districts with only a 24 hour waiting period and fish their original district during that waiting period further contributed to a general consensus that fishing effort at Egegik would rise above historic peak levels.

With no price dispute in effect between fishermen and processors at the onset of the season, fishing began as soon as salmon began to arrive. Initial landings occurred June 3 from Egegik set nets (Table 14). Small catches of sockeye, kings, and chums were registered up through June 15 as more fishermen and processors arrived on the grounds. By June 15 the first evidence of greater than normal inseason effort in the fishery surfaced when several groups of fishermen who normally fish the Nushagak district for kings transferred instead to Egegik to fish sockeye.

Per Board of Fisheries direction the north Egegik line was identified June 15 by "emergency order". A Loran C bearing, the 9990-Y-32570 line corresponding to the inshore location of the existing north Egegik shore marker, was identified as the north line for the season. This and other management related information was discussed with fishermen at a Lower Bristol Bay Fish and Game Advisory Committee meeting held in Egegik on June 16.

The South Unimak and Shumagin Islands sockeye catch reports through June 14 totaled 722,000 and 195,000 fish respectively, indicating no apparent weakness in early run strength at those locations. Early Port Moller test fishing results were also encouraging, although use of new, more effective, nets made interpolation of catch results somewhat subjective. Age analysis of Port Moller catches indicated good strength in the dominant 5(3) age group run component consistent with preseason age projections, so essentially all of the early season sockeye indicators pointed toward an optimistic outlook regarding returning run strength.

By June 17 most fishermen had arrived on the grounds and catches began to increase. An aerial survey of the district indicated 210 drift boats, 111 set nets, and 16 buyers were present and confirmed the presence of approximately 2,000 early run sockeye already milling in Egegik Lagoon. Catches during the

week of June 17-22 totaled 457,000 sockeye, roughly three times the recent 5 year average for this time period (Table 14). Although effort was slightly above average at this point catches were far above normal, indicating either a larger than average or earlier than usual run was in progress. The accumulative king salmon catch through June 22 totaled about 2,000 indicating an average harvest in spite of slightly above average effort. The accumulative chum catch of 10,000 fish was also greater than normal for this point in the season (Table 14).

The fishery closed for the weekend at 9:00 a.m., Saturday, June 22 and was therefore already closed at the 9:00 a.m., June 23 onset of the "emergency order period". With over 2,000 sockeye enumerated past the Egegik River counting tower (Table 24), and an estimated 6,000 additional fish above the fishery in downriver areas the district remained closed June 23 to provide additional escapement protection for early run sockeye and peak run king salmon. Sockeye escapement totals improved only slightly at the counting tower over the period June 23-25 and inside test fish catches in the lower river remained low, yielding an accumulative passage estimate of 39,000 fish through June 25 (Table 30). As at least 100,000 early run sockeye were desired in the escapement, the fishery remained closed. No estimate of king salmon escapement rates into King Salmon River was possible due to glacially turbid river waters.

An increase in the rate of sockeye passage at the inside test fish site was observed on June 26 and the accumulative passage estimate increased to 90,000 fish (Table 30). Based on this increase a 12 hour commercial opening was announced for June 27 (4:00 a.m. to 4:00 p.m.). Daily district registration data (Table 12) indicated 619 units of drift gear were registered to fish the district on this opening. In an attempt to provide equal opportunity for all user groups to compete at the onset of the opening, the fishery was scheduled to

begin at low water on a +4.0 holdover tide (Red Bluff time), thus providing that most set netters would have water at their sites when drift gill nets were initially deployed. Otherwise few fish would be available to them with such massive amounts of drift gear in the outside waters.

Initial impressions of the June 27 opening midway through the period indicated a good mix of drift and set net success. Set nets on the north outside flats (Red Bluff to the north marker) did very well indicating strength in the district in that area. Set nets in the Coffee Point to King Salmon River area did relatively poorly while those upriver in the Egegik River channel and in the south channel areas did moderately well on the tail of a school that moved upriver just prior to the opening. Drift boats at the beginning of the ebb were concentrated near the north Egegik line and in the "north flats" area apparently working the same school as the north flats set netters. An all time record 679 drift vessels were counted fishing (Table 14).

The June 27 fishing period closed on schedule yielding a catch of 873,000 sockeye, breaking the previous single daily harvest record for the district (782,000 fish on July 2, 1984). It also yielded the highest average catch rate per hour for the season, almost 73,000 sockeye/hour, and brought the season's accumulative catch up to 1.3 million sockeye (25% of the preseason harvest forecast). Normally only 13% of the season's catch has been obtained by this date. Escapement past the tower through midnight, June 27, totaled 16,000 sockeye, a normal level in spite of record harvest effort (Table 30). Both these parameters supported the developing premise that a larger than normal run was returning to the district.

Fishing remained closed June 28 while the catch from the June 27 opening was being tabulated and analyzed. Inside test fish results indicated a small drop was occurring in fish passage rates in the lower river (Table 30). This

drop, however, was less than expected assuming the fishery cleaned the district June 27. Either a new surge of fish through the district was occurring or the inside test fishery was operating on flush back fish from upriver. The accumulative inside test fish index through June 27 totaled 3,598 index points which when multiplied by 88 (the 17 year mean fish/index) yielded an accumulative fish passage estimate of 317,000 sockeye past the test fish site (Table 30). Based on these figures and an increasing rate of escapement past the counting tower on June 28, a 12 hour fishing period was announced for June 29 (6:00 a.m. - 6:00 p.m.). Again the opening was scheduled to begin on a large holdover low tide (+5.6 feet) to provide all gear types throughout the district the opportunity to fish effectively at the onset of the period.

An aerial survey of the district at 10:00 a.m., June 29 revealed that both gear types were doing well. Set nets on the "north flats", in the south channel, and in the lower Egegik River were mostly loaded with fish. Drift boats (n=629) were doing well throughout the district although most were fishing the "north flats" and north boundary areas. Ninety drift boats were fishing upriver of Egegik village on the tail of a large school of fish moving upriver. Egegik River was full of fish with an estimated 300-400,000 downstream of the lagoon and another 128,000 in the lagoon (Table 30). With 61,000 fish already counted past the tower through midnight June 28 and the above fish visually documented downriver, it was apparent that approximately 500,000 fish (50% of the point goal) were now past the fishery and on the verge of being officially recorded in the escapement count. As the normal peak of the fishery was not yet due for another 5-7 days, the commercial opening was extended an additional 25 hours (until 7:00 p.m., June 30) rather than obtain more escapement from this one segment of the run.

Commercial catches June 29-30 totaled 1.1 million and 804,000 sockeye respectively, bringing the season's accumulative catch up to 3.3 million fish, 61% of the preseason projection (Table 14). The June 29 catch established a new single daily harvest record for the district, the first time a daily catch has exceeded 1.0 million sockeye at Egegik. The fishery was allowed to close at 7:00 p.m., June 30 to await catch tabulation and further escapement assessment.

The district remained closed to fishing until 9:00 a.m., July 2 and then reopened for 12 hours on a +6.1 holdover low tide (Table 11). Escapement past the tower through midnight July 1 totaled 257,000 fish. Inside test fish indices June 30-July 1 were mediocre compared to those June 28-29, evidence the fishery cleaned the district fairly well on the previous opening.

Initial observations of the July 2 opening indicated the district was "flat" compared to catch success in recent openings. Set net catches were weak throughout the district, and numerous drift boats were observed maneuvering for position with little gear deployed on the beginning of the ebb in the outer district obviously looking for shows of fish. Based on these indicators, the fishery was allowed to close at 9:00 p.m., July 2. Considering timing of the peaks in the fishery over the past several years, it was felt that a "lull" between peaks had been encountered. A catch of 592,000 sockeye was recorded July 2 from 500 drift nets and 212 set nets (peak set net effort during the season) so initial impressions on this occasion were not very accurate regarding fish availability (Table 14).

The fishery, however, remained closed July 3-4 as inside test fish indices remained low to moderate (Table 30). An outside test fish boat, the F/V "Anna Paul", skippered by John Knutsen, was dispatched July 4 to test fish concentrations at six locations in and around the district (Table 8). Results indicated the presence of fish at each sample station with largest concentrations noted

between Coffee Point and Red Bluff, and also just north of the northern district boundary (Table 8). In addition to test fish results, a 6:00 p.m., July 4 aerial survey of Egegik River yielded an estimate of 119,000 sockeye in Egegik Lagoon with another 150-200,000 in the river downstream (Table 30). When added to the 476,000 accumulative count past the tower, an approximate total of 750,000 fish was visually accounted for in waters already past the fishery. As the lower end of the escapement goal range (800,000 fish) was fairly well assured and more fish were entering the district, the fishery was reopened for 12 hours at 12:00 noon, July 5, on a +4.8 holdover tide (Table 11).

Inside test fish indices improved July 5 indicating movement of fish from the district and into the river. Early catch reports and spotter pilot observations indicated good success by both drift and set net users from Coffee Point on out in the outer district, and in the upper end of the inner district (lower Egegik River). With 596,000 fish counted past the tower (accumulative) through 6:00 p.m., July 5, the fishery was extended 24 hours until 12:00 midnight, July 6 (Table 11).

Catches July 5-6 totaled 542,000 and 387,000 sockeye, respectively (Table 14). With escapement counts at the tower progressing satisfactorily (762,000 fish counted through 6:00 p.m., July 6), and additional fish observed entering Egegik Lagoon, the fishery was again extended 12 hours until 12:00 noon, July 7. Good catches were observed in drift gill nets at the north Egegik line and a continuous band of fish was noted passing the counting tower at 8:00 p.m., July 6, during an aerial survey conducted to acquaint Commissioners Phil Smith and Bruce Twonley of the Commercial Fisheries Entry Commission with the Egegik fishery. Based on these observations the fishery was again extended for 26 hours until 2:00 p.m., July 8.

By July 7 the fishery was significantly cutting the volume of fish entering the lower river as indicated by inside test fish indices (Table 30). Earlier immigrants, however, continued to pass the counting tower and the lower escapement range of 800,000 fish was reached July 7. Catches July 7-8 totaled 703,000 and 378,000 fish respectively, bringing the season's accumulative catch to 5.9 million, 10% greater than the preseason projection. The fishery was allowed to close at 2:00 p.m., July 8 to allow a "window" for late run escapement after 74 hours of continuous fishing.

Escapement past the tower through 2:00 p.m., July 9 totaled 854,000 fish, 85% of the desired point goal and over twice the 30 year average escapement attained by this date (only in 1979 was the count greater at this juncture). After allowing a 27 hour period for late season escapement the fishery was reopened for 24 hours at 5:00 p.m., July 9, two hours after low water on a +2.2 foot low tide.

The July 9-10 catch totaled 513,000 fish and indicated continued strength in the district (Table 14). Most of these fish were taken by drift boats in outer district waters. As set nets did poorly throughout the district on July 9-10, it was evident there was no strong push of fish into the river during that interval, raising doubts as to the success of the July 8-9 "window" for escapement. With an abundance of fish already in the catch justification of additional escapement protection was not difficult, consequently the fishery was again allowed to close on schedule at 5:00 p.m., July 10 to insure that adequate late run escapement would be attained.

Escapement past the tower reached 918,000 fish at midnight July 10 and 944,000 by 6:00 p.m., July 11. With additional fish present in downriver areas due to the "windows" mentioned previously, attainment of the escapement point goal was now a certainty, therefore at 6:00 p.m., July 11, the fishery was opened until further notice and the 24 hour waiting period was waived (Table 11).

Catches July 12 were moderately high (391,000 sockeye) but they tailed off rather quickly in the ensuing few days (Table 14). The fishery remained open continuously until 9:00 a.m., July 20 as effort and catches dropped. By July 24 daily catches were below 10,000 sockeye and only a few boats continued fishing (Table 14). Small landings continued, mostly from set nets, throughout July and August with the final sockeye of the season landed August 30.

Escapement counts continued through July 20. The point goal of 1.0 million sockeye was reached July 12 and daily counts then dropped quickly, eventually reaching 1.1 million fish (Table 30). Escapement was successfully attained from each segment of the run with peaks at the counting tower noted June 30, July 4-6, and July 12. July 6 was the single largest counting day with 155,000 fish passed (Table 30). Sampling of the escapement indicated a sex ratio of 58% females and 42% males was attained.

Age group 5(3) was the dominant component in the Egegik sockeye run comprising 57% of the escapement and 50% of the catch as opposed to the preseason projection (63% of the run). Age groups 4(2) and 5(2) exceeded preseason forecasts in their contribution to the Egegik run while age group 6(3), percentage-wise, fell short of its expected strength (Tables 2 and 3).

A record 47 buyers operated in the district during the season (44 bought sockeye), an increase of 24% over buying effort in 1984 (Table 38). In spite of the record breaking nature of the season's total catch, and several instances of new daily harvest records established for the district (including one 18 hour catch of over 1.1 million fish), there were no reported instances of inadequate processing available to handle the catch. Most of the harvest was taken aboard floating freezer processors or tendered to other districts for processing. No new shore based facilities were operated this season.

Fishermen harvested 87% of the sockeye run, the second highest exploitation rate on record (behind only the 90% in 1983) and far above the 35 year average of 68%. Over the recent six year period, 1980-85, the run has been harvested at an 83% rate compared to a 59% exploitation rate from 1951-1979. Hopefully the increased escapements attained during this recent six year period (mean=974,000 fish) will suffice to prevent any long-term negative effects from such high exploitation.

The commercial harvest of other salmon species in the district totaled 146,000 fish, 2% of the total district harvest (Table 25). The king salmon harvest of 4,000 was the lowest in the past six years but still above the 20 year average (3,000). The chum salmon harvest of 110,000 was the third largest on record and twice the 20 year average (55,000), and was the third consecutive year that chum harvests in the district have exceeded 100,000 fish. This year was not a cycle year for pink salmon and only a few were reported caught. The coho salmon harvest of 33,000 fish was twice the 20 year average but slightly below the recent six year average (39,000 fish). Due to late season concern for escapement the normal five day/week coho fishery was cut back to four days/week August 27 for the remainder of the season (Table 11).

Aerial surveys in the Egegik district indicated poor escapements of king and chum salmon occurred. Even with increased coverage of spawning areas achieved, only 1,000 kings and 5,000 chums were counted (Table 28). The reason for this situation was the large fishing effort in the district this season and the temporal proximity of the king, sockeye and chum runs. To counter-act the fleet's impact on these smaller runs in the future, more early (pre-June 23) and late (July 10-20) "windows" for escapement should be employed. No coho spawning ground surveys were flown due to budgetary constraints. A total of just over 5,000 cohos were observed upmigrating in Egegik River but these are only partial data based on three day's aerial observations (Table 28).

In retrospect the season was memorable for a variety of reasons, including the record effort present, the record catch attained, the weak king and chum escapements, and the usual set net community complaints regarding their catch success. Also, post-season analysis of sockeye scales from the Egegik catch showed interception of Kvichak bound fish at a 20-25% rate during two sampling periods (June 29 and July 6-7). Looking forward, it is apparent that increased catch sampling and stock separation analysis will be necessary in future years to pin down interception rates and minimize them where possible, especially in years when adjacent district runs are forecast to be near maintenance levels. With a larger component of the overall Bristol Bay drift fleet now familiar with the Egegik district, greater effort can be expected there in future years when the district's forecasts are attractive. Enforcement in the district was much improved in 1985 and it will be necessary to sustain this in future years if large fleets are to be kept within legal fishing boundaries. Opening fishing periods on large holdover low tides or 1-2 hours into the flood after low water resulted in all user groups getting an initial opportunity to fish effectively this season. Without this or similar measures the large drift fleet would completely shut off the set net catch in the district. This opening policy can probably be refined further but to be fair to all users it needs to be continued when gear levels are high. Adding a few more closed periods prior to the onset of the "emergency order" period will help in getting more king salmon to the spawning grounds. Similarly, invoking a few more closures after July 10 will add more chums to the escapement. It may be necessary to continue regulating openings in the sockeye fishery even after the sockeye point escapement goal is attained rather than announcing "fishing until further notice" at that point. Eventually a system of daily escapement monitoring for kings, chums, and cohos in King Salmon River and for cohos in Egegik River will need to be implemented if management success of these species is to improve.

Ugashik District

The 1985 sockeye run to the Ugashik district was the largest on record totaling 7.4 million fish (previous high was 4.3 million in 1983). It exceeded the preseason forecast of 5.6 million by 31% (Table 1), and yielded the largest harvest in the 92 year history of the fishery, 6.3 million fish. An escapement of 1.0 million fish was attained, exceeding the point goal of 700,000 by 44%, the seventh consecutive year of escapements in excess of 1.0 million fish. Compared to similar cycle years dating back to 1955, the 1985 run was the largest on record exceeding the cycle year average (1.8 million) by a factor of four. The preseason outlook for the district was very optimistic with both a record run and record harvest predicted (Table 1). Both the fishing and processing sectors were aware of the projections and planned in-district operations accordingly.

Initial sockeye landings were recorded in the district June 11 from drift boats targeting on king salmon (Table 15). Small sockeye catches were landed throughout the mid-June weekly open periods totaling 51,000 fish by the onset of the "emergency order period" June 23. Historic catch records from 1962-84 indicate this was the largest reported sockeye catch on file for the district prior to June 23. Accumulative catches of over 4,000 kings and 2,000 chums prior to June 23 indicated larger than normal harvests of these species were also occurring. The significance of these larger than normal catches was tempered by the fact that district fishing effort was approximately three times greater than usual for this early part of the season, 100 units versus an average of 30 units for the years 1979-84 (Table 12). In consideration of the above factors the fishery closed at 9:00 a.m., Saturday, June 22 and remained closed at the 9:00 a.m., June 23 onset of the "emergency order period" to provide an opportunity for both sockeye and kings to enter the escapement.

The fishery reopened for 12 hours at 4:00 a.m., June 27 to provide data on fish distribution, size and age composition for use in run assessment. A fleet of 132 drift boats and 36 set nets participated, with 26 tenders present. Aerial observations indicated the first sockeye of the season had entered Ugashik Lagoon, evidence that fish bound for this district were in fact moving through the fishery and into the escapement. A flight over the district yielded observations that fish were present throughout the fishing area although not in any great concentrations. Set nets at Muddy Point and Ugashik village did moderately well (150-200 fish/net) while those at Pilot Point, Smoky Point and on the north outside beach averaged 15-50 fish/net. Most drift effort midway through the ebb was just north of the entrance bar off Smoky Point. Ultimately, a catch of 92,000 sockeye was taken during this opening (Table 15). The fishery closed on schedule at 4:00 p.m., June 27 to permit catch tabulation and analysis.

The first escapement past Ugashik tower occurred June 21 (Table 24). With an estimated 9,000 fish present in the river (based on inside test fish indices) and reports from the test fish crew that "jumpers" were noted at Ugashik village downstream of the test fish site, a 12 hour fishing period was announced for June 29 (6:00 a.m. - 6:00 p.m.).

An aerial survey of the fishery at 11:00 a.m., June 29 yielded observations indicating a good abundance of fish throughout the outer district. Set nets from Smoky Point to Muddy Point in the inner district were doing poorly, but a strong showing of fish was observed upriver (from Dog Salmon River to Ugashik village) and Ugashik village set nets were full of fish. Based on these observations, indicating schools of fish both in the river and on the "outside", the fishery was extended 25 hours until 7:00 p.m., June 30 (Table 11). After reports of moderate success during the day the fishery was allowed to close on schedule at 7:00 p.m., June 30.

Catch tabulation indicated the harvest over the June 29-30 period totaled 669,000 sockeye bringing the accumulative catch to 813,000 fish, 16% of the preseason forecast (a level normally reached on about July 4). Age composition samples from the June 27 catch indicated stronger than expected percentages of age groups 4(2) and 5(2) fish and weaker than projected percentages of age groups 5(3) and 6(3). The greater than expected percentages of age groups 4(2) and 5(2) were an early indicator that the run might exceed preseason expectations.

The fishery remained closed July 1 and then reopened for 12 hours at 9:00 a.m., July 2 based on high July 1 outside test fish indices (Table 31). An aerial survey of the fishery at 5:00 p.m., July 2 yielded observations indicating a strong showing of fish in nets throughout the district. Set nets on the outside north beach and all along the inside beach from Dago Creek to Muddy Point were doing well (estimate 400 fish/net). Drift boats were making good catches near the entrance bar and South Spit areas, and a few boats were even fishing the inner bay, and it was apparent that a large number of fish had moved into the inner district with more to follow. Additionally, set nets at Ugashik village were doing well indicating continued strength in the lower river. Based on these positive factors the fishery was extended another 24 hours until 9:00 p.m., July 3 (Table 11).

Inside test fish indices increased again July 3 and an estimated 322,000 fish were projected to have passed the test fish site to date (Table 31). Less than 1,000 of these fish however, had passed the counting tower, evidence they were milling in downriver areas. The fishing district was fogged in July 3 preventing aerial surveys to assess fleet success. With the catch ahead of schedule and the escapement past the counting tower slightly behind the 30 year average, the fishery was allowed to close at 9:00 p.m., July 3.

Catches July 2-3 totaled 888,000 sockeye bringing the accumulative catch to 1.7 million fish, 35% of the preseason harvest forecast (still four days ahead of the long-term average). The July 3 catch alone of 613,000 fish broke the previous single daily harvest record of 436,000 sockeye set July 10, 1983 (Table 15). Age composition data from the catch continued to show greater than expected levels of age groups 4(2) and 5(2) fish. These age groups were also present in even greater percentages in scale samples taken from the inside test fish catches indicating they were representative of the age components in the escapement, as well as catch, and not indicative of intercepting fish bound for other districts.

Inside test fish indices climbed to the highest levels of the season on July 4 (Table 31). An aerial survey of Ugashik Lagoon yielded an estimate of only 2,000 sockeye present but produced an estimate of 41,000 additional fish just downstream. A reconnaissance of the lower river by boat using the inside test fish crew indicated the lower 12 miles was "full of fish". With these factors as a basis, the fishery was reopened for 12 hours at 1:00 p.m., July 5.

Reports of fleet success in the outer district July 5 indicated moderate catches were being taken. Inside set nets were making average catches but Ugashik village set nets (n=11) were "slugged" and required the attention of two tenders to service the nets. Inside test fish indices remained high so the fishery was extended another 24 hours until 1:00 a.m., July 7 (Table 11).

Catches July 5-6 totaled 823,000 sockeye, bringing the accumulative catch to 2.5 million fish, 51% of the preseason harvest projection (a level normally reached July 10). Escapement past Ugashik tower through midnight, July 6, totaled 19,000 sockeye (right at the 30 year average count for that date). Inside test fish indices July 6 remained high, and the accumulative inside test fish indices through July 6 totaled 18,723, which when multiplied by 35 (the 15

year mean fish/index) yielded a total passage estimate of 655,000 fish past the test fish site (Table 31). Based on these indicators the fishery was again extended 25 hours until 2:00 a.m., July 8 (Table 11).

Inside test fish indices remained high July 7, and migration rates past Ugashik tower increased dramatically (to 5,300 fish/hour) through 6:00 p.m. Large catches were reported from Ugashik village set nets and from outer district drift boats so the fishery was again extended 25 hours until 3:00 a.m., July 9.

Escapement past Ugashik tower through midnight, July 7, totaled 127,000 fish, a level normally attained by July 12. The catch July 7 totaled 699,000 sockeye, a new daily district catch record (Table 15). An estimated 350 boats and 59 set nets were participating in the fishery at this point.

Escapement rates at the tower dropped to 1,100 fish per hour on July 8 and inside test indices also began to decline as expected after 2 1/2 days of continuous fishing. However, as both the catch and escapement were far ahead of schedule the fishery was extended another 25 hours until 4:00 a.m., July 10 (Table 11).

The commercial catches July 8-9 totaled 362,000 and 320,000 sockeye respectively, and while still large, these catches were down considerably from catch rates obtained July 5-7 (Table 15). Inside test fish catch rates and inner district set net catches were also on a declining trend (Table 31). With 3.9 million fish in the catch (79% of the preseason forecast) and 176,000 fish counted past the tower through July 9 (25% of the point goal), the fishery was allowed to close on schedule at 4:00 a.m., July 10.

Accumulative inside test fish indices through July 10 totaled 26,611 which when multiplied by 35 fish/index yielded an estimate of 931,000 fish past the test fish site (Table 31). Fishermen reported making good catches in the outer district waters near the close of the period July 10, and that fish were moving

well inside the district later in the day (evidenced by fish seen on fish finders from boats anchored among the tenders outside Dago Creek). Based on these reports as well as aerial survey observations (33,000 fish in Ugashik Lagoon) and the fact that escapement totals past the counting tower were the largest on record (through July 9), the fishery was reopened for 12 hours at 5:00 a.m., July 11.

A total of 534 boats were registered to fish the district July 11 (Table 12). No actual boat count was possible due to fog in portions of the district but it was evident during a 2:00 p.m. aerial survey of the district that a very large number of boats were fishing. Large catches were observed at the north marker (Cape Grieg), all along the north outside beach, at Smoky Point, and all along the inside beach from Pilot Point to Muddy Point. The southern outer district was too foggy to survey. The only mediocre catches noted were from set nets at Ugashik village. A survey of Ugashik Lagoon yielded an estimate of 57,000 fish (many turning red) waiting to move up past the counting tower (Table 31). With approximately 234,000 fish visually accounted for in the escapement (177,000 accumulative tower count + 57,000 in Ugashik Lagoon) through 3:00 p.m., July 11 the fishery was allowed to close on schedule at 5:00 p.m.

The July 11 catch totaled 711,000 sockeye (Table 15), a new single daily harvest record for the district, and yielded the largest catch per fishing hour of the season (59,000 sockeye/hour). It brought the accumulative harvest to date to 4.8 million fish (98% of the preseason forecast). The long-term catch curve shows 63% of the season's catch normally attained through this date.

Inside test fish indices July 9-11 had been steadily declining but the trend reversed significantly July 12 (Table 31). Based on this indicator of fish strength in the lower river and also the catch distribution showing fish throughout the district July 11, the fishery reopened for 11 hours at 8:00 p.m., July 12. An aerial survey of the river just prior to the opening confirmed large

numbers of fish present throughout the river. Large concentrations were noted downstream of Ugashik village, in the upper 10 miles of river below Ugashik Lagoon, and in the lagoon itself (estimate 245,000 fish) (Table 31). Based on these indications of escapement strength the opening was extended 12 additional hours until 7:00 p.m., July 13).

An estimated 528 boats and 59 set nets (peak daily effort) fished the district July 12-13 (Table 12). Lower catch rates were reported than those attained the past two days, but inside test fish indices continued to climb, indicating continued strength in the lower river. The fishery was extended again 24 hours until 7:00 p.m., July 14.

The July 12-13 catch totaled 370,000 sockeye, considerably down from catch rates July 10-11 (Table 15). Escapement past Ugashik tower through midnight July 13 totaled 335,000 fish (48% of the point goal). Escapement counts during the morning of July 14 increased dramatically (8,700 fish/hour) as a surge of fish moved upriver out of Ugashik Lagoon but, based on the desire to obtain escapement from all portions of the run, dropping inside test fish indices July 14, and enforcement related problems developing in the district, the fishery was allowed to close on schedule at 7:00 p.m., July 14. Enforcement personnel reported large scale violation of the outer district line by numerous fishermen on July 14. Two enforcement boats were on hand and tried to respond to the situation but were unable to contain the violators due to the sheer volume of boats involved. As this occurred on a reasonably clear day during daylight hours, it was obvious the fleet was testing management and a strong counter response was necessary.

Escapement past Ugashik tower through July 14 totaled 584,000 sockeye (83% of the point goal) and hourly counts remained high on the morning of July 15 (Table 31). Based on the escapement rates the fishery was reopened for 25 hours

at 8:00 p.m., July 15. A stern warning to the fleet, noting that a repetition of the mass line violations seen July 14 would be countered with "set net only" openings in the future" accompanied the opening. No repeat of the boundary problems occurred during the July 15 opening. It was obvious to the fleet early in the June 15 opening that fish abundance was continuing to drop and by July 16 a fairly large contingent pulled their gear and left the district.

The escapement point goal (700,000 sockeye) was reached at Ugashik tower at midnight, July 15 (Table 31). The fishery was subsequently opened until further notice and the 24 hour waiting period was waived at 9:00 a.m., July 16, and the inside test fish program was terminated (Table 11). Daily catches tailed off over a fairly long time period with harvests greater than 50,000 fish per day occurring through July 24 (Table 15). There were still 65 drift boats fishing the district July 26. Catches then dropped to very low levels and eventually ceased with the final sockeye landed September 2 (Table 15).

Escapement counts continued through August 3 eventually reaching 998,000 sockeye (Table 24). The single largest passage day at the counting tower was July 14 with 249,000 fish counted. Three distinct peaks were noted in the tower counts (July 7, July 13-15, and July 26-27) indicating a good mix of early, middle and late fish. Sampling at the counting tower indicated females outnumbered males almost 2 to 1 (65% to 35%) in the escapement and that age groups 5(3) (51%), 4(2) (24%), and 5(2) (16%) were the major run components. Aerial surveys in the Dog Salmon and King Salmon River drainages subsequently added an additional 8,000 fish to the system wide sockeye escapement (Table 28), bringing the final Ugashik district sockeye escapement estimate to approximately 1.0 million fish.

The commercial fishery took slightly over 86% of the sockeye returning to the district, the highest exploitation rate on record (dating back to 1951), exceeding the 35 year mean exploitation rate of 62%. The previous highest exploitation was 77% set in 1983.

The district harvest of other salmon species totaled 186,000 fish, 3% of the total district salmon catch (Table 25). The king salmon catch of about 7,000 fish was greater than the long-term average (5,000) but was close to the recent 7 year average (6,000). The chum salmon catch of 119,000 fish was the second largest on record and over twice the long-term average of 47,000. Hardly any pink salmon were recorded in the district this season. The coho salmon catch of 61,000 fish was the second largest on record and three times the long-term average of 21,000 (Table 25). There may have been a problem in the reporting of cohos however, as the 50 drift boats fishing during the coho fishery often moved back and forth between the outside waters of the Cinder River and Ugashik districts, and it is doubtful that they segregated their catches during deliveries. Therefore, it is probable that some Cinder River cohos are included in the Ugashik district reported catch.

Escapement surveys flown in August indicated an adequate count of king salmon (7,000) and a rather small count of chums (29,000) on the spawning grounds (Table 28). Concern for coho escapement late in the fall fishery resulted in reduction of the weekly fishery from five days to four days/week beginning August 27 and continuing through the end of September. Aerial counts subsequently documented 19,000 coho in clear water areas upstream of the fishery on September 12 (Table 28). No estimate of actual spawning numbers was obtained.

A record total of 35 buyers operated in the district, a 26% increase over 1984 levels (Table 38). In spite of an all time record total catch, and four daily catches exceeding the previous single daily catch record (436,000 fish), there were no reported instances of plugged processors or fishermen being placed on limits. Nearly all the catch was either frozen on floating processors or tendered to other districts for processing. The only shore based operator was a small hand pack cannery at Ugashik village.

Enforcement in the district was much improved over recent years. One patrol vessel spent most of the season (June 27-July 26) in the district and was joined by a second larger vessel on several occasions. Additional aircraft support was also supplied using an amphibious Grumman "Goose" and other smaller aircraft.

Some issues of management concern that arose during the season were:

1. record effort levels (both fishermen and processors);
2. the perception by fishermen outside the district that Ugashik fishermen were intercepting fish bound for other districts;
3. dissatisfaction with catch success from the set net user group in the district;
4. line violations en masse by drift fishermen late in the sockeye fishery;
5. a smaller than desired chum escapement;
6. difficulty in assessing coho escapement rates inseason, and
7. difficulty in identifying Ugashik versus Cinder River cohos in the Ugashik catch reports.

The record effort levels were handled effectively initially by short periodic openings but eventually run strength itself was sufficient to nullify most potential problems posed by hordes of eager fishermen and processors. Set netters shared in the harvest although not at historic catch percentage levels. Ugashik village set nets were very successful while Smoky Point and Pilot Point set netters had sub-par seasons. New set net sites were pioneered on the north outside beach (7 sites) and near Cape Menshikoff on the south outside beach late in the season (5 sites). Post-season scale analysis indicated a very minimal interception rate occurred in the district during the two periods sampled (June 27 = 2% and July 7-8 = 6% Kvichak sockeye). The chum escapement was affected by the large fishing effort and tendency for fishermen to stay later than usual "scratch fishing" in district waters. Adding additional closed periods during the July 15-25 time period in the future will aid in attaining larger chum

escapements. Additional aerial surveys inseason and catch analyses will be necessary in the future to protect coho escapements as the fishery continues to grow. Establishment of a closed "buffer" area between the Cinder River and Ugashik districts may be necessary to aid in segregation of catches in the future. Either that or beefing up the enforcement effort to a level that would force fishermen to comply with regulations requiring them to deliver in the district fish are caught will be necessary if catches are to be accurately reported. Warning drift fishermen that mass line violations would be countered with "set net only" openings seemed to get their attention on one occasion this season. Hopefully future use of this mechanism won't be necessary to ensure line observance.

Nushagak District

Expectations for Nushagak district in 1985 were as varied as this district's salmon runs. Commercially significant runs of all five species of Pacific salmon return to Nushagak, and an important part of fisheries management effort in this district is directed toward monitoring the developing runs of these salmon stocks.

The preseason sockeye salmon inshore pooled forecast, to all river systems in 1985 totaled 4.3 million, with 2.3 million assigned to Wood River, 307,000 to Igushik River and 1.7 million to Nuyakuk River (Table 1). Snake and the Nushagak-Mulchatna River systems, which are no longer officially forecast, could be expected to produce another 200,000 fish, based on historical run magnitude. The actual inshore district return of 3.0 million sockeye was only 69% of the pre-season forecast (Table 1).

The second consecutive king salmon forecast of 179,000 fish proved to be remarkably accurate, when 191,000 kings returned to the district watershed. Chum and coho salmon returns, which are not officially forecast, were expected to produce average returns, although the inadequate escapement data base,

especially for coho salmon, was cause for concern over run strength reliability. Actual inshore returns of both species were well below expectations: chums - total return of 541,000 compared the long-term average (1966-84) of 719,000, and cohos - total return of only 110,000 fish compared to the average (1980-84) of 388,000.

The Nushagak district commercial salmon season commences in late May with a sizable fishing fleet directing its efforts at the district's returning king salmon stocks. Since 1978 fishing effort on kings has increased dramatically and the larger effort has placed additional pressure on the king salmon resource.

Initial king salmon commercial catches were poor, and the run appeared to be showing late run timing and/or less strength than forecast. Accumulative catches through the weekend closure on June 8-9 were just under 10,000 fish, compared to the long-term average of 13,000 through this date (Table 16). Late run timing was suspected, as lake and river ice breakup in the Nushagak watershed was delayed, and heavy spring rainfall and river discharge was pronounced in all river systems. Additionally, colder than normal air and water temperatures were expected to affect migration timing. Dillingham air temperatures, as maintained by NOAA, were 12°, 4° and 3° colder than the long-term average for April, May and June, respectively.

Although age structure analysis of the king commercial catch was running about as expected, the low catch (most of which came from outside district waters) and lack of significant escapement, prompted a decision to modify the regular five day weekly fishing schedule by advancing the emergency order period to June 8 and closing the outside district waters to commercial fishing (Table 11).

Monitoring of king salmon escapement continued and by June 13, subsistence net king catches in the Dillingham area and at the upriver Lewis Point fish camps improved significantly (with strong 20-30 mph SSW winds), indicating that

kings were beginning to move out of the fishing district and into the river (Table 10).

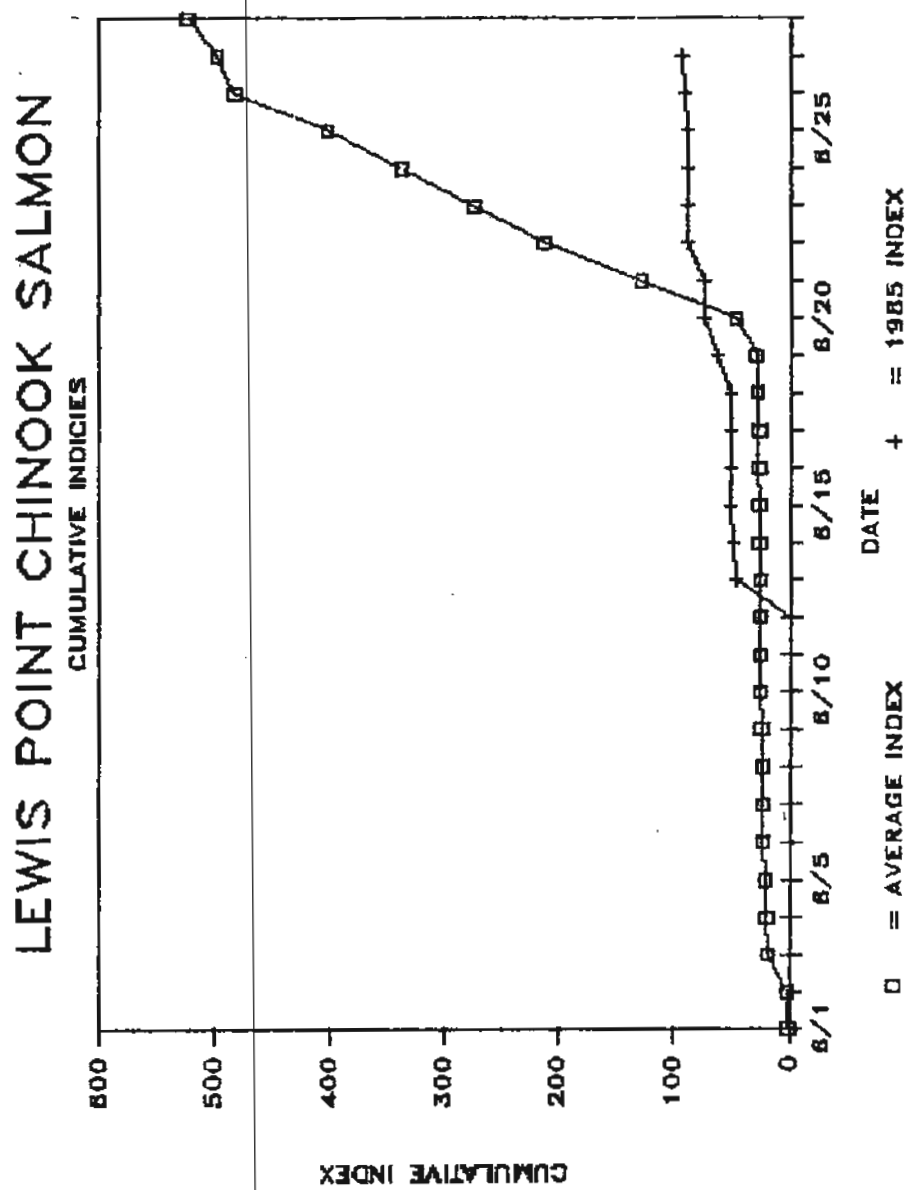
With the improved king escapement rate, especially at the Lewis Point test fishing site (Figure 3), a 12 hour fishing period was announced for June 14 (Table 11). With the long six day closure (June 8-14), many fishermen began to transfer out of Nushagak to other districts, and the remaining available fishing fleet of 255 drift units was well under the 500 to 600 units experienced in recent years.

The commercial catch of under 6,000 kings was disappointing, and further reinforced the conservative management approach already in effect (Table 16). Interest now focused on run timing, as the king return continued to suggest late run development. Historical late king runs were examined to help guide expected run development in 1985. King salmon returns in 1971 and '75 both exhibited late run timing, with commercial catches peaking on June 25-27 and June 16-18, respectively, and with 20% and 14%, respectively of the season commercial catch accounted for by June 14-19.

With the accumulative commercial king catch now at 16,000, compared to the long-term average of 31,000 and sampling continuing to show virtually no significant age class difference between that forecast, the fishery would remain closed until escapement rates improved significantly.

Escapement rate monitoring of kings continued on both Dillingham subsistence beaches, and at the Lewis Point subsistence test fish monitoring site (Table 10). Further, the adult sonar counting station on Nushagak River below Portage Creek was now operational and would be watched closely. King salmon daily sonar escapement rates on Nushagak River remained low through June 19, and the accumulative escapement was less than 1,000 fish (Table 25). However, subsistence

Figure 3.



king catches in both the Dillingham area and at Lewis Point increased significantly on June 19, when SE winds began to move fish up-river (Table 10 and Figure 3). CPUE of kings in Dillingham subsistence nets ranged from 6 per net (Kanakanak beach), 10-20 per net (Scandinavian beach) to 50-55 per net at Nushagak Point on the east side of the district. It was apparent that a significant number of kings were moving upriver and with suspected late run timing and only 11% of the preseason forecast accounted for, additional fishing time was warranted.

A 12 hour fishing period was announced for June 20, and initial aerial survey observations of fleet success were disappointing. Only 165 drift units and 79 set nets participated in the June 20 period, as many fishermen had transferred out of Nushagak, primarily to Egegik and Ugashik districts. King salmon catches totaled only 5,000 fish, bringing the accumulative catch to 21,000, compared to the long-term average of 48,000 through this date (Table 16).

Age class analysis of the king catch through June 20 continued to show close agreement with the forecast. The Nushagak River sonar king escapement rate picked up on June 20-23 and then fell off again June 24-26 (Table 25). Opinion on run strength was varied, but all data still suggested that the kings were still holding in the district.

The outside Nushagak test boat was sent on her first series of trips on June 27-29 with the dual purpose of documenting incoming sockeye salmon movement, as well as holding king salmon within the district. Test net catches showed conclusively that sockeye salmon were holding in the outer district, and that significant numbers of kings were holding as well, primarily in the upper district area (Table 9). By now it was apparent that the king and sockeye run would arrive together, and that it was imperative that the closure be maintained to secure adequate king escapement before arrival of the sockeye salmon run. In addition, the closure was expected to improve early escapement of sockeye salmon, especially to the Nuyakuk River drainage.

Naknek River sockeye salmon began to push on June 26 and tower counts began to accelerate rapidly the following day (Table 24). The Naknek River sockeye run timing is watched closely, as Wood River escapement counts usually follow Naknek by 3 to 4 days. If the Naknek-Wood River timing relationship held in 1985, Wood River could be expected to accelerate on about June 30-July 1, and these fish would be available about June 29-30 in the upper portion of Nushagak district.

The outside test boat began to show movement of sockeye salmon in the early morning hours of June 30, with moderate sockeye catches made at Nushagak Point and on Combine beach in the upper district (Table 9). Outside test fish indices also showed conclusively that significant king salmon upriver migration was taking place in the upper district. Through June 29 the Nushagak River sonar escapement estimate of 19,000 kings was well below the point escapement goal of 75,000 fish. With the improvement of the king escapement rate into the river, and the need to harvest some early arriving sockeye salmon, to help define the age composition structure as it relates to the forecast, additional fishing time was now warranted.

Nushagak district was subsequently opened to fishing for a 12 hour fishing period on June 30 (Table 11). An informational announcement was issued at 6:00 p.m. on June 29, that a "short notice" fishery opening was possible on June 30 (Table 11). The short notice announcement possibility gave all fishermen early warning of the possibility of fishing time, and gave management additional time to analyze run strength and timing data.

As per preseason plans, the fishing period announced for June 30, allowed set net gear only in the Igushik section, which was intended to keep the highly mobile and effective drift net gear off of Igushik River sockeye stocks, which were forecast to be weak (Tables 2 and 11). Additionally, in an effort to provide further protection to Nushagak-king salmon stocks, large mesh king gear was prohibited.

Salmon catches on June 30 amounted to over 379,000 fish: 278,000 sockeye, 24,000 kings, 78,000 chums and fishing effort was estimated at 179 drift units and 234 set nets (Table 16). Although the sockeye catch was significant, it was not in the expected range of 350 to 450,000 if the Department's pooled forecast of 4.3 million was to occur. The June 30 sockeye catch of 278,000 was more in line with the standard ADFG forecast of 3.3 million, and the lower catch planted the first seed of doubt about Nushagak district's run strength (Appendix B).

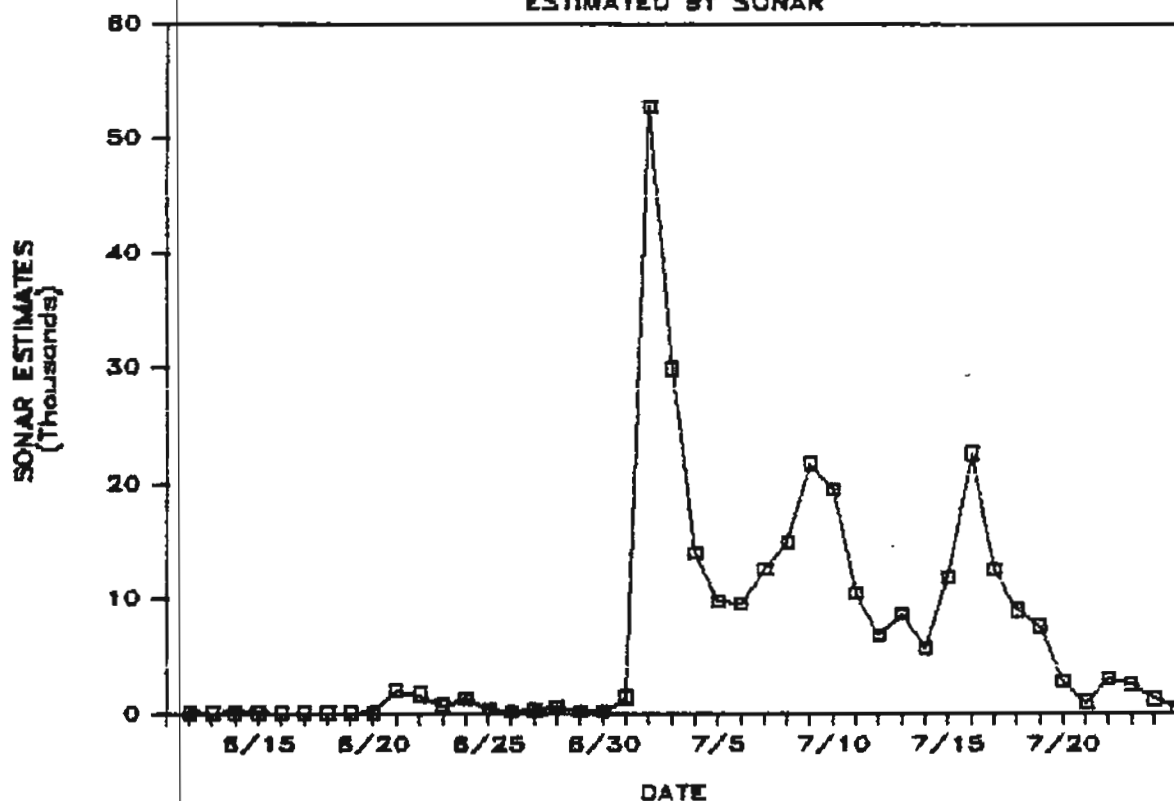
Sockeye salmon escapement to Wood and Nushagak/Nuyakuk Rivers (Figure 4) began to accelerate right on schedule on July 1, and both rivers were estimated to have received (counted tower/sonar escapement plus downriver aerial estimate): Wood - no less than 150,000 fish and perhaps as many as 250,000 if lower river muddy waters held the same migration rate as the upper areas, and Nushagak/Nuyakuk-sonar expected to go 60 to 80,000 through July 1, with fish present below sonar (Tables 33 and 35). Sockeye escapement past the lower river test fish site on Igushik River was estimated at 45,000 through July 1 (Table 34).

With all rivers showing rapidly increasing sockeye escapement rates, and continuing fishermen reports of "finners and jumpers" at Grassy Island and along the "Combine", additional fishing time was clearly warranted without delay, or the balance between catch and needed escapement would quickly be in disarray.

Another 12 hour fishing period was announced for July 2 with continued set nets only in Igushik section and with large mesh king gear prohibited (Table 11). The commercial sockeye catch on July 2 of 207,000 was below expectations, however aerial surveillance of Wood and Nushagak/Nuyakuk Rivers on July 2 continued to show accelerating sockeye escapements: Wood - over 200,000 fish accounted for with heavy fish sign in the lower river area; and Nushagak/Nuyakuk - over 100,000 fish with broken bands 3 to 4 fish wide below the sonar site (Tables 32 and 35). Igushik River sockeye escapement was progressing satisfactorily with over 47,000 fish estimated past the test fish site through July 2 (Table 34).

NUSHAGAK RIVER SOCKEYE ESCAPEMENT

ESTIMATED BY SONAR



NUSHAGAK RIVER SOCKEYE ESCAPEMENT

ESTIMATED BY TOWER *

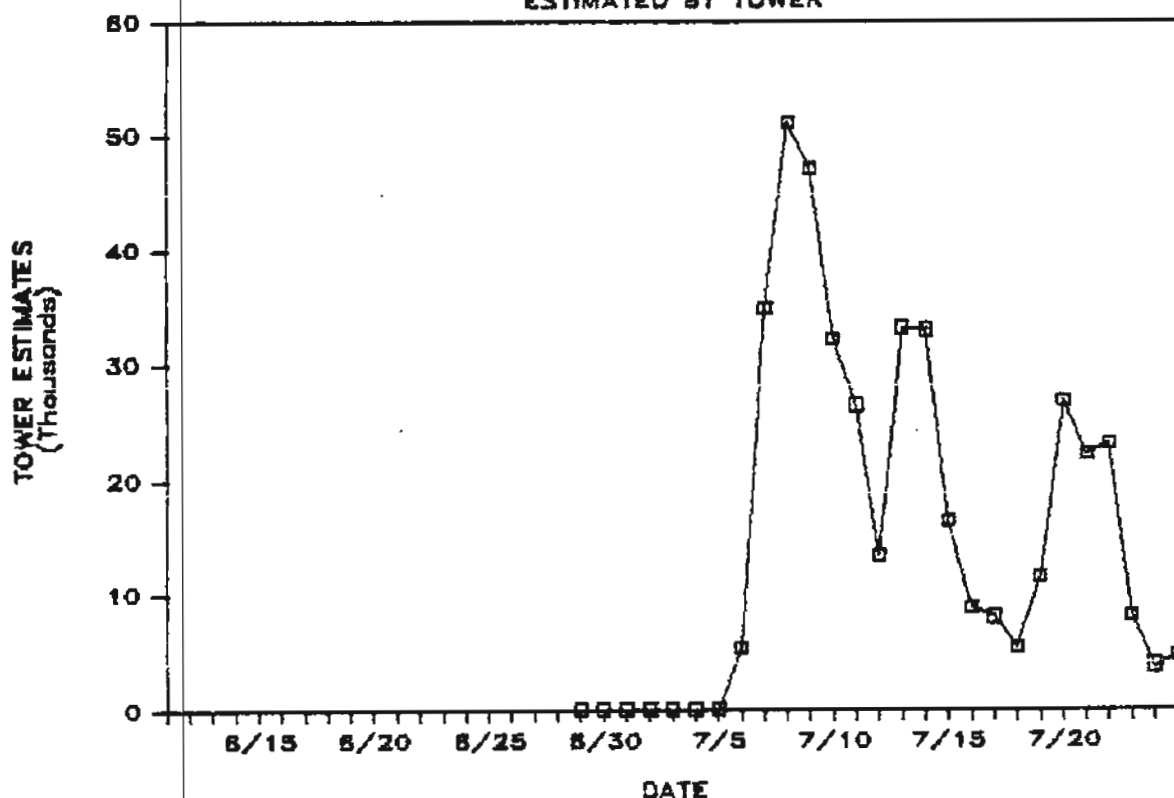


Figure 4. Sockeye salmon daily escapement rates at sonar site on Nushagak River and tower site on Nuyakuk River*, Nushagak district, 1985.

Through 6:00 p.m., July 3, only 1.1 million sockeye salmon had been accounted for in Nushagak district, catch and escapement combined, and if the ADFG standard forecast of 3.3 million were accurate, only 33% of the Nushagak district run had been accounted for.

Another 12 hour fishing period for July 4-5 was announced based on: (1) continued good show of fish in Wood River - 46,000 aerial estimate below the tower, maybe as many as 100,000 including lower river, and tower/aerial counts showing 35% of the escapement goal achieved (Table 32); (2) strong show of fish in Nushagak River where lower river and sonar count was approaching 200,000 (40% of the escapement goal) (Table 35); (3) increased escapement rate at Igushik River, where the passage by the test fish site was now estimated at 83,000 fish, or 42% of escapement requirements (Table 34); and (4) well over 2.0 million fish to show even if run strength was closer to the standard ADFG forecast.

Large mesh king gear was prohibited again (for the last time), and the July 4-5 fishing period saw a continuation of set net only fishing in the Igushik section until run strength was totally defined (Table 11). Initial indications (radio traffic and Department aerial surveillance) suggested that the July 4-5 period catch rates were down from the previous period. Final sockeye catch amounted to 150,000 fish, down from the previous period on July 2-3 (207,000), which dispelled any consideration for a fishing period extension (Table 16).

The Nushagak outside test boat was sent back out on the July 5 late evening tide to help monitor incoming fish movement. Fishermen reports from the July 4-5 period indicated that sockeye were still holding and ebbing each tide, and came in as far as Clark's Point on the July 4-5 opener, but moved back out on the ebb. If the test boat sockeye catches show in-district fish movement, another fishing period would be in order, as only 36% of the standard forecast had been accounted for through July 5, and every indication was pointing toward a delayed run which

had been building in the outer district. If fish began to move inriver hard, it would be best to put the relatively small drift fleet on the front end of the movement, or escapement might accelerate beyond where control was possible.

Aerial surveillance of Wood and Nushagak Rivers continued on July 5, and both rivers showed a declining sockeye escapement rate (Tables 32 and 35). However, the following morning (July 6), outside test boat catches were analyzed from all the night test sets, and as expected, catch indices showed a strong in-river movement of sockeye from the Grassy Island/Nushagak Point area, all along Combine, and as far south as Ekuk Bluff (Table 9). Through 6:00 a.m., July 6, sockeye escapements were: Wood - 390,000 (39% of the escapement goal); Nushagak-Nuyakuk - 135,000 (27% of requirements); and Igushik - 114,000 past the test fish site (57% of requirements) (Tables 32, 34 and 35). Both Wood and Igushik Rivers were on the long-term accumulative curve through this date to obtain escapement needs, while the Nushagak-Nuyakuk River system escapement estimate of 135,000 was less than expected.

Another 12 hour fishing period was announced at 7:30 a.m., July 6, for a July 6-7 period, with set net only allowed in Igushik section, where the sockeye run does not appear to be stronger than forecast. Aerial surveillance of early catch success at 4:00 p.m., July 6, indicated the strongest sockeye showing of the season. The catch was estimated at 350 to 450,000 fish of all species, while the final sockeye catch amounted to 379,000, bringing the accumulative catch to 1.0 million (Table 16).

Continued aerial surveillance of Wood and Nushagak-Nuyakuk Rivers on July 6-7 showed a low daily sockeye escapement rate (Tables 32 and 35), while the Igushik River sockeye escapement was continuing right on schedule, and through July 7 158,000 fish (79% of requirements) were estimated to have passed the Igushik test fish site (Table 34).

The outside Nushagak test boat completed another series of test drifts on July 7-8 to help determine inner district run strength. Strong escapement indices were obtained at Picnic Point and Grassy Island late in the evening of July 7; test catches in these two locations were most likely to be of Nushagak-Nuyakuk River origin (Table 9). Strong sockeye catch indices were also obtained at Ekuk Bluff, and at Nushagak Point on the return trip the following morning (July 8), indicating significant sockeye run strength in both the inner and middle district areas (Table 9).

Sockeye escapement rates into Wood, Igushik and the Nushagak-Nuyakuk River systems continued to improve. Wood River sockeye escapement reached 436,000 through 6:00 a.m., July 8, and was projected to reach 500,000 (or 50% of escapement requirements) through July 8 (Table 32). The Igushik River counting station had accounted for 52% of escapement needs (or 103,000 fish), while the downriver test fishing program suggested that 92% of escapement requirements had been met (Table 34). The Nuyakuk River counting station sockeye rate of escapement improved considerably, and the escapement of 197,000 fish projected through July 8 was 39% of requirements (Table 35).

Through July 8, the Nushagak district total sockeye catch and escapement was projected at 1.9 million fish, only 44% to 58% of the composite and standard ADFG forecasts, respectively. The Nushagak district run had apparently been holding both within and in outside district waters. With the strong inriver sockeye escapement taking place, as shown by test boat catches, additional fishing time was announced for July 8-9 (Table 11). The Igushik River sockeye escapement was still progressing at a rate which suggests that the run was on schedule to obtain escapement requirements. Fishing with set nets only in Igushik section would be continued until apparent run strength was sufficient to obtain escapement needs.

The sockeye catch for the 12 hour fishing period on July 8-9 was poor (107,000) and it was now apparent that the Nushagak sockeye run had peaked (on July 6-7), and that a total run nearer the lower standard ADFG forecast of 3.3 million was more likely (Table 16). With the Nushagak sockeye run now totaling over 2.0 million (catch plus escapement), or 60% of the lower standard ADFG forecast, only about 1.0 to 1.3 million fish might be left to work with. Since over 700,000 sockeye were still needed for escapement in the Wood and Nuyakuk River systems, and the run appeared to be past the peak, a very conservative approach to further fishing time would be maintained.

However, the Igushik River sockeye run seemed to be building right on schedule to meet escapement requirements. After analysis of both the downriver Igushik test fish catch indices (which indicated 184,000, or 92% of escapement needs were met) and counting tower escapement at the lake outlet (128,000 escapement or 64% of requirements), the Igushik section was reopened to fishing with set nets only on July 10 (Table 11).

Fishing time in the Igushik section was subsequently extended on a daily basis through the end of the emergency order period on July 17 (Table 11). Fishing with drift net gear was finally allowed effective 7:00 p.m. on July 13, when 95% of escapement requirements were met, and it was certain that escapement objectives were virtually assured (Table 34). Meanwhile the Nushagak section remained closed to build sockeye escapement into the Wood and Nushagak-Nuyakuk River systems where escapement objectives were not yet met.

After a six day closure (July 9-15) of Nushagak section, sockeye salmon hourly escapement rates into the Wood River system began to improve mid-day on July 14, and by midnight the escapement had reached 786,000, 79% of escapement objectives (Table 32). The hourly rate of escapement from midnight on July 15 through 6:00

a.m. indicated a daily escapement of 90 to 120,000, which would place the Wood River escapement at 88% to 91% of the goal.

Aerial surveillance in the early morning hours of July 15 also confirmed the strong escapement rate in the lower Wood River, when over 37,000 fish were estimated from the counting tower to muddy water in the midriver area (Table 32). Nuyakuk River sockeye escapement had also improved with the long six day closure, and was approaching the lower end of the escapement goal range of 300,000 (Table 35). Late run sockeye salmon in Nushagak district are commonly primarily of Wood River origin, and Nuyakuk River sockeye stocks would normally have peaked, and would not provide much late season run strength. With the above in mind, the Nushagak section was opened for a 12 hour fishing period on July 15 with the possibility of an extension of fishing time based on escapement rates (Table 11). The Nushagak section fishery was subsequently extended through 9:00 a.m., July 17, when hourly escapement rates into Wood River continued to show strength, and that the escapement goal would be met (Table 32). Nuyakuk River was expected to benefit less than Wood River (Wood picked up about 220,000 sockeye) from this late season movement through the district, and was expected to total approximately 380,000 fish. In fact, Nuyakuk River picked up about 100,000 fish, and eventually reached an escapement of 429,000 sockeye (Table 24).

Sockeye salmon age class structure was monitored all season long, and had generally closely matched the preseason forecast. However, the Wood River sockeye escapement was watched closely, as the management plan called for inseason adjustment of escapement requirements depending upon actual ocean age composition of the escapement. Long-term studies of Wood River sockeye stocks have shown that 2-ocean age sockeye tend to frequent the system's extensive beach spawning areas, whereas 3-ocean age fish utilize the limited creeks and rivers of the Wood

River Lakes system. These two ocean age groups tend to cycle, and cycles are often independent of each other. River and creek spawners (3-ocean age fish) tend to have peaked reproduction curves and are sensitive to over/under escapements, while beach spawners (2-ocean age fish) have flat reproduction curves and wide ranges of escapements tend to produce good returns.

The management plan for modifying the Wood River escapement was developed to allow inseason adjustment of escapement needs. Major components of the variable escapement goal strategy were to: (1) place a minimum range limit of 800,000 sockeye on the Wood River escapement when the percentage of 3-ocean sockeye exceeded 60%; (2) place an upper limit of up to 1.5 million sockeye escapement requirement when the percentage of 2-ocean fish exceeded 60%, with actual apparent run size also taken into consideration; (3) adhere to a point escapement goal of 1.0 million if ocean age components are approximately equal; and (4) that the Nuyakuk River escapement goal (500,000), and progress toward that escapement objective, would be a priority factor in all regulatory decisions.

Actual Wood River daily sockeye escapement age composition was monitored on a daily basis, by compiling length frequencies to separate 2 and 3 ocean fish, and this analysis was followed up within 24 hours by actual scale analysis of age. Table 33 shows the season results, and similar to prior years, data in 1985 showed relatively close correlation between the two analysis methods. In 1985 the actual age composition ran approximately 50:50 2/3 ocean sockeye all season long, which indicated no change in the 1.0 million preseason escapement objective (Table 33). In retrospect, the decision to not adjust the escapement downward may eventually prove to be unfortunate, as over 57% of the Wood River sockeye escapement spawned in the Agulowak River (75,000) and Agulukpak River (448,000).

Escapement objectives in these two rivers total about 350,000, and the escapement goal was exceeded in the Agulupak River, and future returns may be adversely affected. An examination of spawning ground distribution of sockeye salmon in the Wood River Lakes systems shows poor distribution (disproportionately heavy river spawners) in 5 of the past 6 years (1980-85). It is apparent that the Wood River escapement goal concept needs additional input of expected spawning ground distribution regardless of ocean age composition. Poor smolt production from large unevenly distributed escapements since 1980 are a matter of record, and Wood River adult production seems to be headed back to the lower range of returns (1.3 to 1.8 million) experienced prior to 1978.

All major manageable river systems in Nushagak district reached or closely matched sockeye salmon escapement objectives in 1985: Wood - 939,000 compared with a goal of 1.0 million; Igushik - 212,000 with a goal of 200,000; and Nuyakuk - 429,000 with a goal of 500,000 (Table 1). Escapement was successfully attained from each segment of the run with peaks at the counting towers as follows: Wood - July 1-4, July 8-10 and July 14-15; Nuyakuk - July 6-8, July 12-13 and July 19-21; and Igushik - July 3-11 (Table 24). Elimination of gill net mesh size minimum restrictions in 1985, had no apparent effect on sex ratios of escapements in the major river systems. Sampling of the escapements indicated sex ratios of: Wood - 55% females to 45% males; Igushik - 60% to 40%; and Nuyakuk - 61% to 39%.

The holding pattern and sudden movement of sockeye salmon allowed a close look at migration timing patterns this season:

- (1) sockeye moved from the mid-district areas (Queen Slough to Ekuk) on June 29 to Wood River tower in 48 hours;
- (2) the same group of fish that commenced migration on June 29 also reached the sonar site on Nushagak River in 48 hours, indicating that about 75% of the sockeye that reached the Wood/Nushagak tower/sonar sites between July 1-5 were of Wood River origin;

- (3) sockeye took 6 days to migrate between the downriver Nushagak River sonar site to the upriver Nuyakuk River tower site on July 1, 4-5 days on July 8 and 4 days on July 15 (Figure 4); and
- (4) a 4 day mean passage rate was suggested from the downriver Igushik River test fish site to the counting tower.

The sockeye salmon return of 3.0 million fish to Nushagak district was the second consecutive year that the total run size fell below expectations (Table 4). After six years (1978-83) of outstanding returns, which averaged 8.6 million sockeye salmon, 1984-85 saw total returns of 4.0 and 3.0 million, respectively. The lower return in 1984-85 is primarily due to extremely poor production from large record escapements obtained in 1980. The 1980 brood year escapements continued the "very poor" production first seen last year when age 4(2) returns were well under expectations. This year's return of age 5(2) sockeye from 1980 nearly completes total production from the 1980 brood year, as none of the Nushagak district river systems produce many age 6(2) fish. Through 1985 all of this district's major sockeye producing river systems saw extremely low return per spawner production from the 1980 brood year: Wood - 0.52 return per spawner compared to the 1956-79 average of 2.33; Igushik - 0.15 return per spawner compared to the average of 3.32; and Nuyakuk - 0.22 return per spawner compared to the average of 5.17.

The Wood River system produced 1.7 million sockeye in 1985, virtually identical to the standard ADFG forecast of 1.8 million, but under both the past 20 year (1965-84) long-term average of 2.2 million, and the more recent 10 year (1975-84) average of 3.0 million (Figure 5). Igushik River saw a 1985 total return of 392,000, similar to the 307,000 forecast, and well under both the long-term average total run of 815,000, and recent 10 year average of 1.2 million (Figure 5). Nuyakuk River sockeye contributed only 706,000 fish in 1985 compared

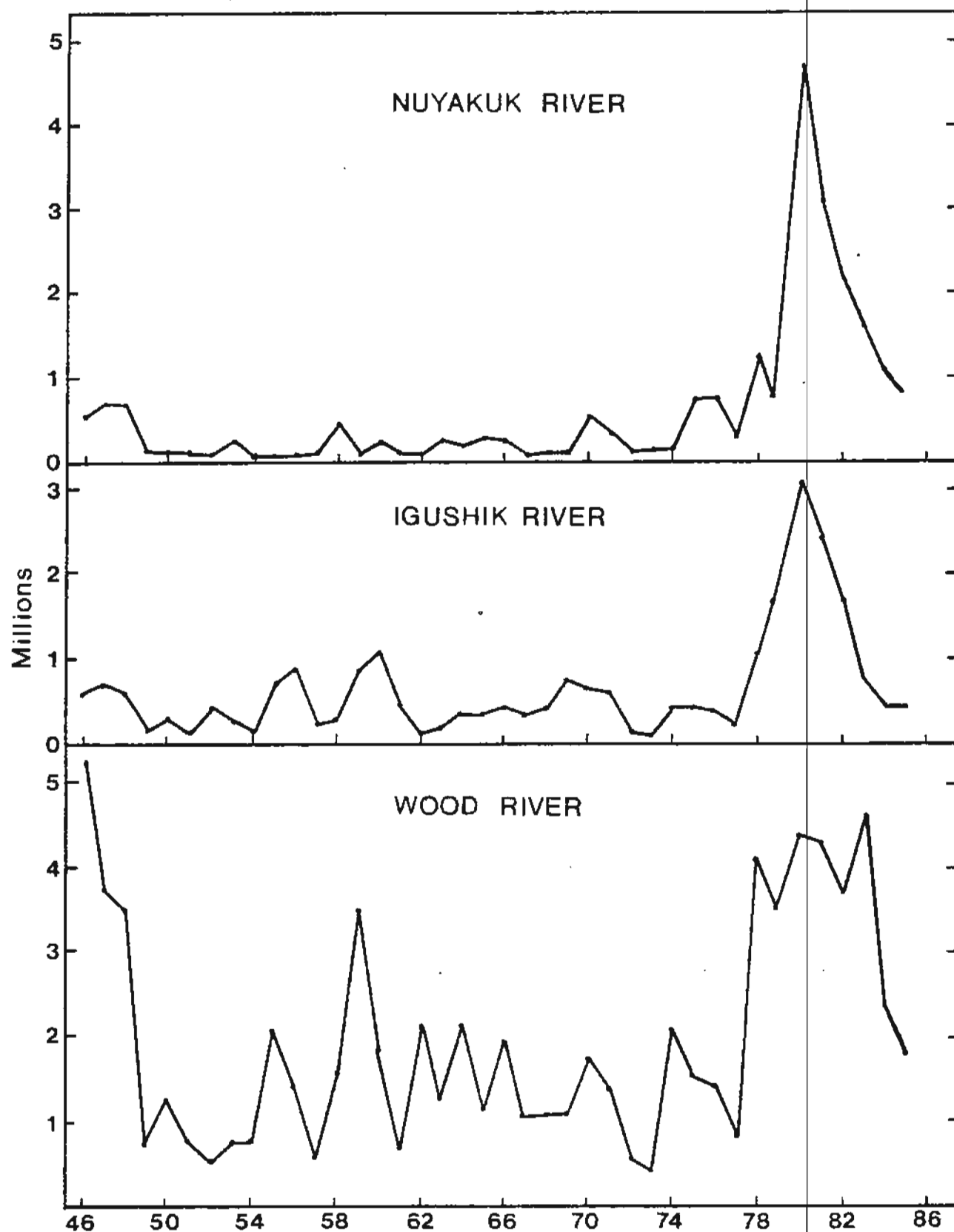


Figure 5. Total inshore return of sockeye by major river system, Nushagak district, Bristol Bay, 1946-85.

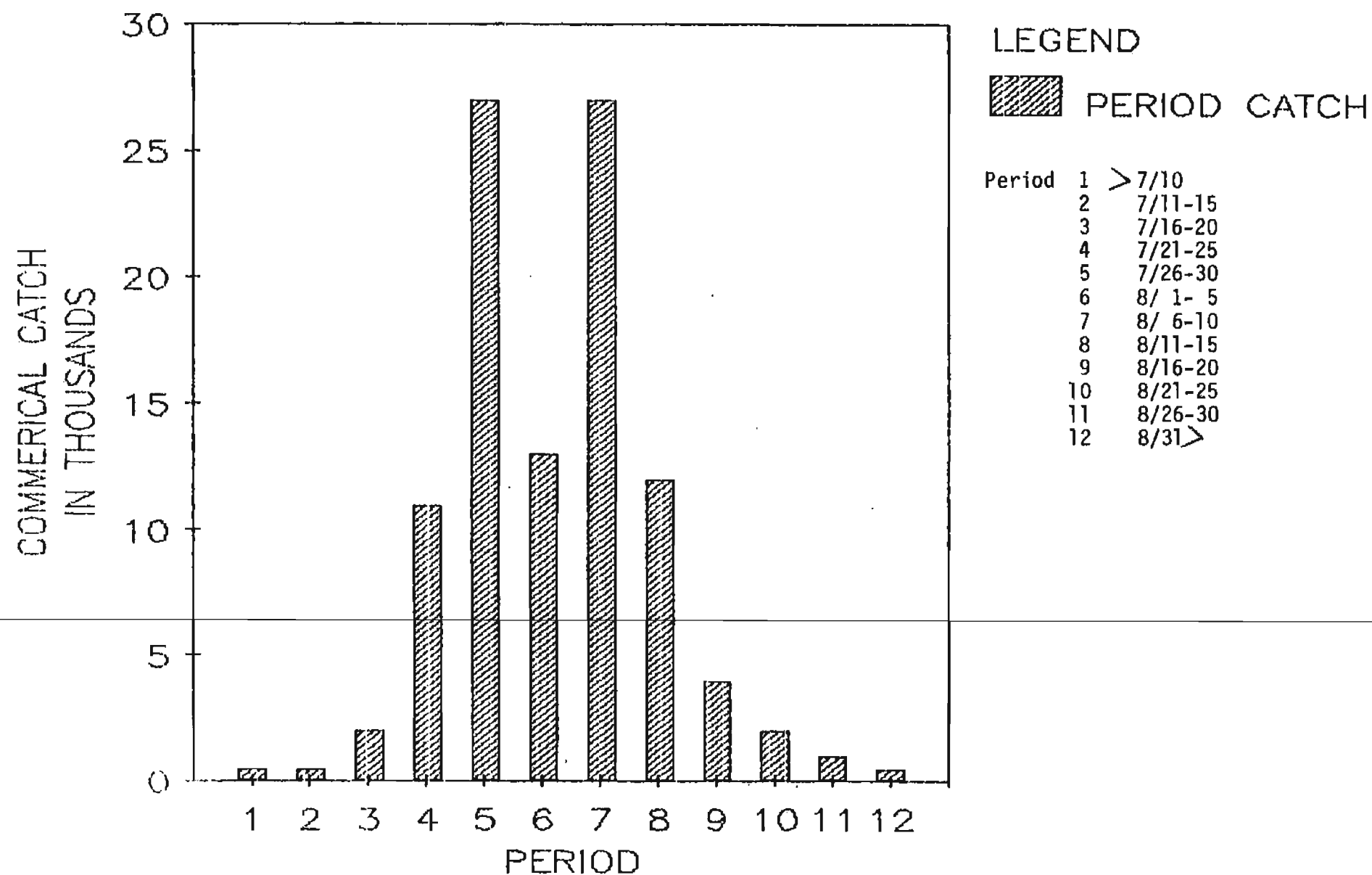
to the forecast of 1.7 million, which was comparable to the long-term average total run of 1.0 million, but well under the recent 10 year average of 1.7 million (Figure 5).

Nushagak district sockeye production by river system has changed significantly in the last 20 years - Wood River is now producing 48% (1975-84) of Nushagak sockeye compared to 62% in 1965-74. The slack has been taken up by Nuyakuk River production - from 254,000 average return in 1965-74 to 1.7 million in 1975-84. Recent year sockeye returns to Nuyakuk River have proven this systems ability to return to meaningful production. Achieving consistent optimum escapements into Nuyakuk River is the key to sustained good production into Nushagak district in the future.

After the emergency period on July 17, fishing directed at coho salmon was conducted up through 9:00 a.m., July 27 under the standard five day per week schedule. Coho salmon catches built slowly and by the weekend closure on July 27-28, only 9,000 coho had been caught commercially compared to the average of 37,000 through this date (Table 16). Normally, the Nushagak district coho catch shows a bimodal peak, one occurring about July 26-30 and the second August 6-10 (Figure 6). The Nushagak coho run was either showing late run timing, was weak or a combination of both. A weak run was strongly suspected as both the Japanese mothership coho catches and Popoff Head Shumagin domestic catches were under that expected. The Japanese mothership coho catch of 128,000 was the lowest since 1977, and there seems to be a direct correlation between mothership and Bristol Bay commercial catches in the same year. Coho catches in the Popoff Head Shumagin Island set net fishery were "lighter than expected", and further the joint U.S.-Russian tagging operation that was conducted in the spring of 1985 caught very few coho salmon.

Figure 6.

Nushagak District Coho Salmon Commerical Catch by Week In 1000's of Fish, 1977 - 1985



Coho escapement as documented by the Nushagak River sonar counters at Portage Creek was less than 2,000 through July 28 (Table 27). Rather than shut the fishery completely down, which would inhibit management's ability to assess continuing run strength, the standard five day weekly fishing schedule was modified to two 36 hour periods per week, which would provide two separate 48 hour weekly closures (Table 11).

The first 36 hour fishing period on July 29-30 saw 11,000 coho enter the commercial catch, bringing the season accumulative catch to 20,000 fish compared to the average of 53,000 through this date (Table 16). The coho return in 1985 was mirroring almost exactly the poor daily returns in 1983 when the total run amounted to only 132,000 fish (Figure 7).

The coho escapement at the Portage Creek sonar site continued to lag badly with a low daily escapement rate, and through July 31 less than 2,000 coho had passed the sonar site, while escapement requirements totaled 150,000 (Table 25). It appeared that the coho run was not developing in a normal manner, and catch and escapement rates through July 31 indicated a total run to the district of 55 to 135,000 fish. Even if the coho run returned at the upper range of this run strength projection, the total run would be below escapement requirements.

Over 37% of the commercial harvest occurs between August 1-10, and through August 10 over 74% of the catch is accounted for (Figure 6). Unless the run was showing exceptionally late run timing, the next 10 day period would be instrumental in obtaining escapement needs if the run fell within the projected range of returns. With the foregoing in mind, the second scheduled 36 hour fishing period was cancelled, and the district was closed until further notice (Table 11).

Escapement monitoring continued on a daily basis at the sonar site, as well as additional aerial observations below the sonar site. Although the coho daily escapement rate increased substantially beginning August 5, and peaked on

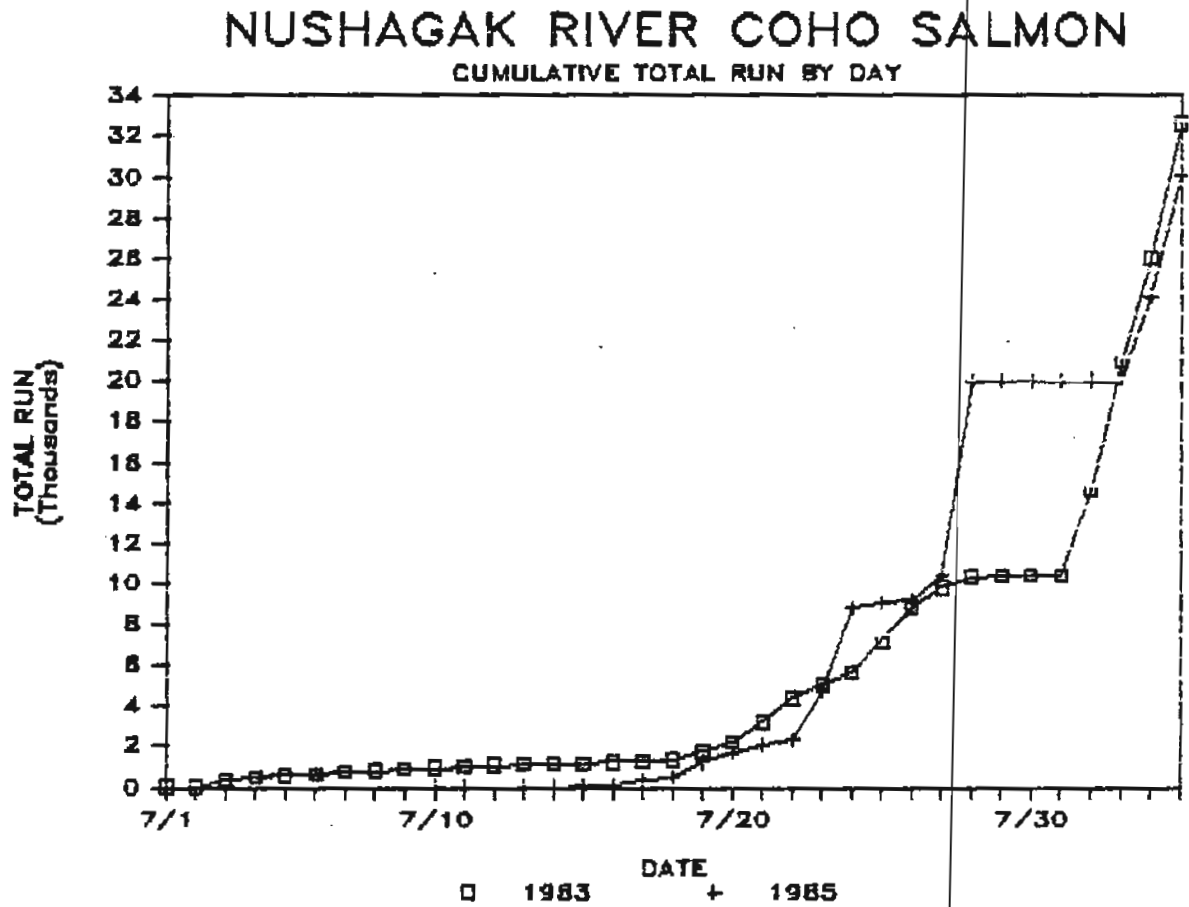


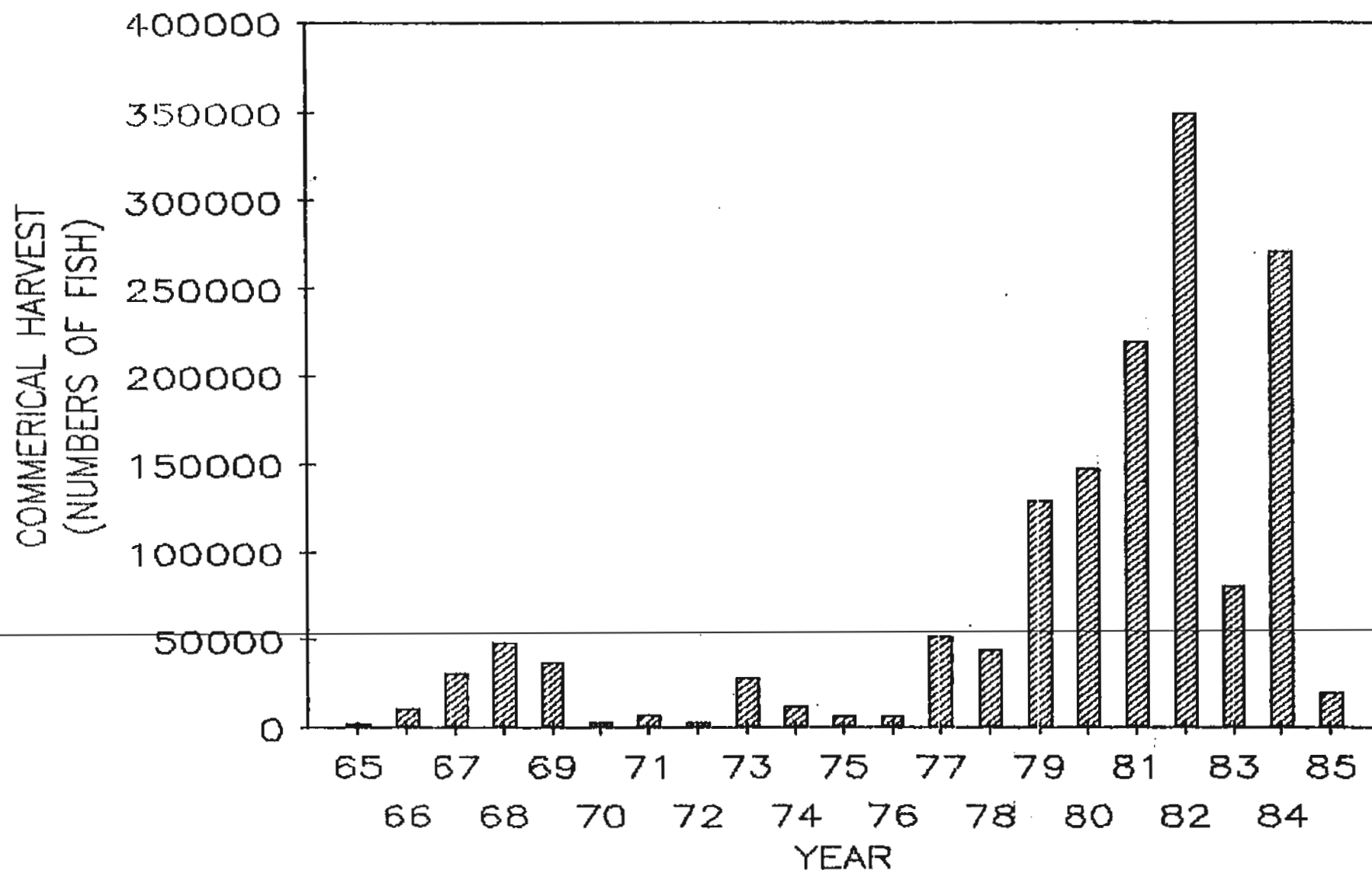
Figure 7. Coho salmon daily accumulative total run, Nushagak district, Bristol Bay, 1983 and 1985.

August 8 at 22,000 fish, the rate then decreased and fell back to a low daily total (Table 25). Fishermen were periodically updated on run strength (Table 11), but by August 15 (when 92% of the run had been accounted for), it was pretty evident that the run was virtually over (Table 25). The fishery did not reopen, and the commercial catch of 20,000 and final escapement of 90,000 (sonar and late season estimate) equaled a total run 110,000, well within inseason projections. The provisional escapement goal of 150,000 coho was not met, although the escapement, which was 82% of the total, was considered adequate. The coho salmon commercial catch of 20,000 in 1985 was the lowest since 1976, and was 73% below the long-term average (Figure 8).

Nushagak king salmon accounted for only 68,000 of the district harvest, but the hard-earned final escapement of 116,000 was only 16% above the upper escapement goal range of 100,000. The total king run of 191,000 was about equal to the long-term average of 172,000.

The Nushagak chum salmon catch of 253,000 was well below the long-term average of 438,000 for this district, while the chum escapement of 288,000 equaled a total run of 541,000 compared to the long-term average of 719,000.

Figure 8. NUSHAGAK DISTRICT COHO SALMON
COMMERICAL HARVEST BY YEAR
1965 - 1985



Togiak District

The 1985 sockeye salmon forecast of 949,000 was the largest preseason prediction ever offered for the Togiak district (Table 1). This large forecast was due primarily to the record parent year escapement in 1980 of 572,000, the majority of which would produce the expected 5 year old return. With the new sockeye escapement goal of 150,000 that was established in 1984, a large harvestable surplus was potentially available at Togiak for the 1985 season. In a normal year, a liberal fishing schedule would be in order. However, due to diminishing runs and production in 1982-84, the general downward trend suggested that the forecast could be an over estimate of the actual sockeye return.

Due to the uncertainty about the forecast, the regular fishing schedule was not altered in the early part of the season. Togiak district is managed differently than other areas of Bristol Bay and has a fixed fishing schedule of four days per week in the Togiak section and five days per week in Kulukak, Osviak, Matogak and Cape Peirce sections. This fishing schedule is adjusted by emergency order, as needed, to achieve desired escapements.

By comparison to the other fishing districts in Bristol Bay, Togiak is the smallest in terms of sockeye harvest, but is an important producer of kings, chums and cohos. Effort levels at Togiak have remained somewhat stable during the main sockeye run for the past several years. Approximately 140 drift units and 40 set nets participate and virtually all are local watershed residents. The normal influx of 32 foot vessels from other districts, to participate in the latter part of the sockeye run, did not occur in 1985 due to the poor Togiak return and the long closure that was in progress. Some additional effort did move to the Togiak area to participate in the coho harvest which peaks in late August and early September.

The first landings of the 1985 season occurred on June 10 and the harvest continued to build until the peak day on July 9 (Table 18). The processing effort was limited to just two operators in 1985 compared to 10 who bought salmon at Togiak in 1984 (Table 38). However, due to the low volume of catch this season, capacity to process the harvest was never a problem.

As early as June 22 the age composition of the Togiak sockeye catch samples began to diverge from the preseason forecast, when the 4(2) age component was only 3% rather than 29% that was predicted. By July 3 sockeye escapement past the tower was falling behind the rate necessary to achieve the goal. On July 4 the sockeye catch in Togiak district totaled approximately 85,000, not dissimilar to the 70,000 caught as of the same date in 1984. The July 4 Togiak section catch of 58,000 sockeye closely matched the 51,000 landed in 1984 (Table 19). These mediocre catches, under good weather conditions, suggested that the run was well under forecast. Kulukak section catches were well ahead of 1984 and confined heavily to the southwest corner of that section, suggesting an interception of Togiak River bound sockeye (Table 20). An aerial survey on July 7 confirmed low numbers of migrating sockeye in the Kanik (Tithe Creek), Kulukak and Togiak Rivers (Table 37). An emergency order issued on Sunday, July 7 added an additional 24 hours to the regular weekend closure in Togiak section, and also closed the Kulukak section for 48 hours (Table 11).

Sockeye escapement past the tower continued to lag and on July 10 the tower count was less than 1% of the goal when the average for that date is 13% (Table 26). An emergency order issued on Thursday, July 11 closed Togiak and Kulukak sections until the following Monday (Table 11). Aerial surveys on July 11 and 14 continued to confirm low numbers of migrating sockeye in the Kanik, Kulukak and Togiak Rivers (Tables 36 and 37). By July 14 the sockeye escapement past Togiak tower totaled 22,000, or 15% of the goal instead of the average 30% by this date (Table 36). An emergency order issued on Sunday, July 14 closed the Togiak and Kulukak

sections for the entire week until Monday, July 22 (Table 11). Aerial surveys on July 17 and 20 confirmed only moderate numbers of sockeye in the major drainages in both Togiak and Kulukak sections (Table 37). On July 21 the escapement past Togiak tower was less than 54,000, or only 36% of the goal (Table 36). At this time it appeared that the sockeye run was only 50 to 60% of the preseason forecast and an additional one week closure was announced to begin on July 22 (Table 11).

Throughout the week the sockeye escapement began to build and by July 25 the Togiak tower count had reached 88,000, or 57% of the goal (Table 36). It was estimated on July 26, using aerial survey methods, that approximately 60,000 sockeye were still in the river below the tower (Table 36). Further improvement in the sockeye escapement rate in both the Kanik and Kulukak Rivers was also noted, so an emergency order was issued on Friday, July 26 reopening both Kulukak and Togiak sections through the weekend, with the regular weekly fishing schedule to resume the next week (Table 11).

The final sockeye catch totaled 210,000 for the entire district combined, the lowest since 1975 (Table 25). The final district escapement was 190,000, therefore the total return of 401,000 sockeye to this district was only 42% of the preseason forecast, and well below the 20 year average of 496,000 (Table 1).

The 1985 Togiak district king salmon catch of 37,000 was excellent and rated third highest in the history of this fishery (Table 25). The district escapement of 14,000 kings was only fair, and well below the recent 10 year average of 22,000. A Fish and Game catch sampling technician stationed at Togiak cannery in 1985, estimated that approximately 50% of the fleet were now using large mesh king salmon gear in the early part of the season, while the use of king gear has been relatively uncommon in the Togiak district in past years.

The chum salmon run in Togiak was only average during the 1985 season. A harvest of 206,000 was surprising, in light of the long closure to obtain sockeye escapements, but is somewhat explained by the shift in effort to the western sections that remained open to commercial fishing, and are primarily chum producing river systems (Table 25). The district-wide escapement of 212,000 approximated the 20 year average of 248,000 (Table 28).

Pink salmon are not a targeted species at Togiak and the very low catch in 1985 is common for the odd year return to this district.

Due to the increased interest in coho salmon in recent years and the annual shift in effort to Togiak to participate in the harvest, management of this species has become more difficult. As of August 15, the district coho catch was just over 8,000, well behind the 1984 harvest of 57,000 fish by the same date (Table 18). Fishing was slow with landings between 40-45 fish per unit of effort. Due to high water and very turbid conditions, aerial surveys were ineffective in documenting escapement, but poor success by the sport fishing effort in the Togiak River indicated that few cohos were passing the commercial fishery. Other river systems in Bristol Bay were showing fair to poor coho returns, with the run in Nushagak totaling only 101,000 as of August 16. Other indications of a potentially weak coho run came from the Japanese high seas mothership vessels which reported the second lowest catch of this species in their records, and both the Goodnews and Kanektok Rivers were reported to have "less than average" coho runs.

Concerns for this valuable salmon resource and the inability to document a significant escapement prompted an emergency order issued August 16 reducing fishing time in all sections of the Togiak district to two 24 hour fishing periods per week (Table 11).

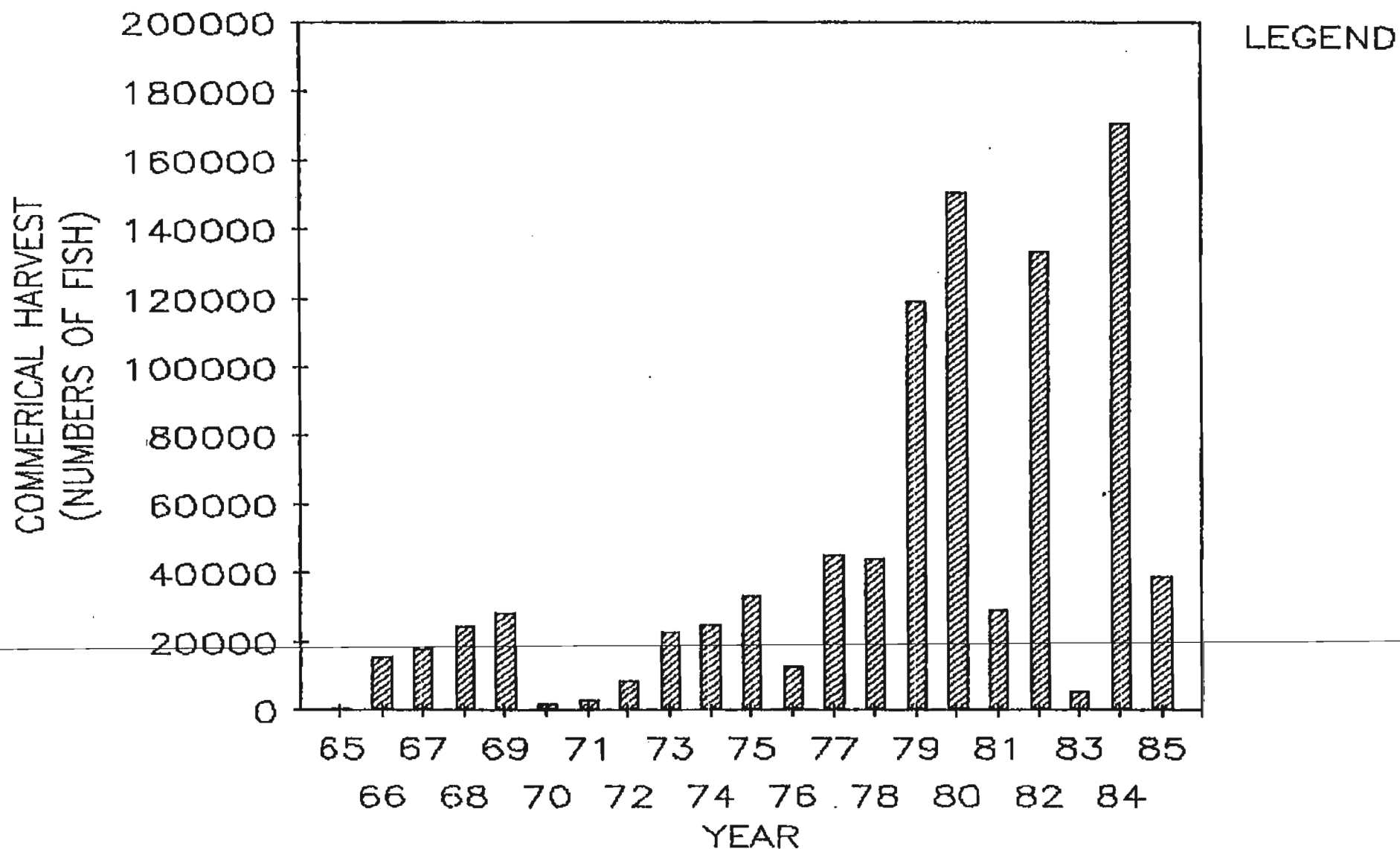
Continued low catches and low coho escapements, as documented by aerial survey methods, resulted in a further closure of the entire Togiak district on August 26 (Table 11). On August 27 the river had begun to clear and the coho escapement into the Togiak and Kulukak systems estimated on an aerial survey on that date, was 10 to 15,000 and 5 to 8,000, respectively, a considerable improvement over the previous week (Table 37). Both river escapements were approaching the lower management range, and assuming normal run timing, were at the 55% point of the run. Sport catches in the lower sections of the river had greatly improved, further indicating an increase in fish movement inshore. Therefore, a 24 hour fishing period was announced for August 28-29 (Table 11).

The resultant harvest of 10,000 coho was considered good for a single fishing period, and raised hopes that the run was not as depressed as it had earlier appeared (Table 18). Sightings on an aerial survey on September 2 (Table 37) confirmed improved coho escapement rates in both the Togiak and Kulukak Rivers, and it appeared certain that both rivers would reach the lower management ranges, therefore a 24 hour commercial opening was allowed on September 4 (Table 11). The resultant coho harvest (4,000) dropped off considerably, and the last remaining processor closed for the season, so no further fishing periods were offered for the 1985 season.

The final Togiak district coho harvest totaled 39,000 (Figure 9) and the escapement was estimated at 61,000 for a total run of 100,000 fish.

Figure 9.

TOGIAK DISTRICT COHO SALMON COMMERICAL HARVEST BY YEAR (1965 - 1985)



1985 SUBSISTENCE SALMON FISHERY

Historically, large numbers of salmon were harvested in Bristol Bay for feeding dog teams, but this practice was greatly reduced with the introduction of the snow machine. In order to document the subsistence removal of salmon, a permit system was initiated in 1963. The permit system has been refined and expanded and this year a total of 1,033 were issued (Table 43). It is felt that the majority of the salmon caught for subsistence are now being reported, the exception being those fish taken by commercial vessels that are consumed on the fishing grounds. Growth of the local population, a yearly influx of non-watershed residents, and a renewed interest in sport dog mushing have resulted in an increase in the subsistence harvest of salmon in Bristol Bay.

Competition for resources and limited available fishing space resulted in regulations restricting subsistence fishing in the Naknek River and Iliamna-Lake Clark drainages to only those persons domiciled in those areas. In 1982 a personal use fishery was allowed for the first time in Bristol Bay. It gave non-traditional subsistence users and non-watershed residents the opportunity to harvest salmon in times of surplus. The personal use fishery was restricted to the Naknek River drainage, and was allowed, only when the sockeye escapement had reached 900,000 fish.

In February of 1985 the Madison decision by the Alaska Supreme Court changed many subsistence regulations statewide. The Madison decision stated that the present subsistence law did not specify rural, therefore the Board of Fisheries had exceeded its regulatory authority by limiting participation and that all State residents qualify and are eligible. It further stated that any stock fished for subsistence in the past must be opened for subsistence again and that this activity could not be restricted until all non-subsistence uses (i.e.: the commercial fishery) had been eliminated.

The Madison decision therefore eliminated the watershed only restrictions and abolished the personal use fishery. The results of this court action were not immediately recognized by the general public and only a small increase in the number of permit holders was observed in the 1985 subsistence salmon fishery. However, as more urban dwellers become aware of their subsistence rights in Bristol Bay, it is likely that the number of participants will increase dramatically in future years.

TABLES

Table 1. Inshore run of sockeye salmon compared with the preseason forecast, escapement goals and forecast commercial catch, by river system and district, Bristol Bay, 1985.

District and River System	Number of Fish in Thousands									
	Inshore Forecast						Inshore Catch 2/			
	Forecast 1/	Actual	Run/Fore.	Escapement 2/			Esc/Goal	Forecast	Actual	Catch/Fore.
				Goal	Range	Actual				
NARNEK-KVICHAK DISTRICT										
Kvichak River	12,182	13,372	1.10	10,000	8,000-12,000	7,211	0.72	2,182	6,160	2.82
Branch River 3/	471	262	0.56	185	170- 200	118	0.64	286	144	0.50
Naknek River	4,868	3,681	0.76	1,000	800- 1,400	1,850	1.85	3,868	1,831	0.47
Total 4/	17,521	17,315	0.99	11,185	8,970-13,600	9,179	0.82	6,336	8,136	1.28
BEGEIK DISTRICT										
	6,590	8,552	1.30	1,000	800- 1,200	1,095	1.10	5,590	7,457	1.33
UGASHIK DISTRICT										
	5,621	7,353	1.31	700	500- 900	1,006 5/	1.44	4,921	6,346	1.29
NUSHAGAK DISTRICT										
Wood River	2,334	1,730	0.74	1,000	700- 1,200	939	0.94	1,334	791	0.59
Igushik River	307	392	1.28	200	150- 250	212	1.06	107	179	1.67
Nuyakuk River	1,706	706	0.41	500	300- 700	429	0.86	1,206	277	0.23
Nushagak-Mul. Sys. 3/		128		50	40- 60	69	1.38		59	
Snake River 3/		52		40	30- 50	35	0.88		17	
Total 4/	4,347	3,008	0.69	1,790	1,220- 2,260	1,685	0.94	2,647	1,323	0.50
TOGLAK DISTRICT										
	949	401	0.42	150	140- 250	190 6/	1.27	799	210	0.26
TOTAL BRISTOL BAY 4/										
	35,028	36,629	1.05	14,825	11,630-18,210	13,156	0.89	20,293	23,474	1.16

1/ Final Bristol Bay sockeye salmon forecast of inshore run for 1985.

2/ Escapement data is final, while catch data is preliminary.

3/ These systems cannot be managed separately from the major system in the district. Consequently, the exploitation rates are merely the catch rates anticipated for the major system in the district; the corresponding escapement goals do not necessarily coincide with the escapement levels which would be achieved if these systems could be managed independently.

4/ Due to rounding, the totals may not equal the sum of the district totals.

5/ Including sockeye run to Mother Goose and Dog Salmon River systems.

6/ Including sockeye runs to the various tributaries and minor river systems of Togiak district.

Table 2. Inshore forecast of sockeye salmon age class return by river system and district, Bristol Bay, 1985.

District and River System	Number of Fish in Thousands								3-Ocean	Total	
	Age Class (Brood Year)				Age Class (Brood Year)						
	4(2)	(1981)	5(3)	(1980)	2-Ocean	5(2)	(1980)	6(3)			(1979)
NAKNEK-KVICHAK DISTRICT											
Kvichak River	938		7,841		8,779	1,271		2,132		3,403	12,182
Branch River	137		174		311	117		43		160	471
Naknek River	1,094		1,972		3,066	1,022		780		1,802	4,868
Total	2,169		9,987		12,156	2,410		2,955		5,365	17,521
EGEGIK DISTRICT											
	287		4,138		4,425	704		1,461		2,165	6,590
UGASHIK DISTRICT											
	881		3,391		4,272	824		525		1,349	5,621
NUSHAGAK DISTRICT											
Wood River	950		474		1,424	835		75		910	2,334
Igushik River	187		16		203	62		42		104	307
Nuyakuk River	1,119		57		1,176	497		33		530	1,706
Total	2,256		547		2,803	1,394		150		1,544	4,347
TOGLAK DISTRICT											
	398		215		613	305		31		336	949
TOTAL BRISTOL BAY 1/											
Number	5,991		18,278		24,269	5,637		5,122		10,759	35,028
Percent	17.1		52.2		69.3	16.1		14.6		30.7	100.0

1/ Sockeye salmon of several minor age classes are expected to contribute an additional 1-2% to the total return.

Table 3. Inshore run of sockeye salmon by age class, river system and district, Bristol Bay, 1985. 1/

District and River System	Number of Fish in Thousands by Age Class						Total
	4(2)	5(3)	2-Ocean	5(2)	6(3)	3-Ocean	
NAKNEK-KVICHAK DISTRICT							
Kvichak River	Number	770	7,788	8,558	1,493	3,285	13,336
	Percent	5.8	58.4	64.2	11.2	24.6	100.0
Branch River	Number	54	12	66	192	3	261
	Percent	20.7	4.6	25.3	73.6	1.2	100.0
Naknek River	Number	761	1,149	1,910	1,366	382	3,658
	Percent	20.8	31.4	52.2	37.3	10.4	100.0
Total	Number	1,585	8,949	10,534	3,051	3,670	17,255
	Percent	9.2	51.9	61.1	17.7	21.3	100.0
EGEGIK DISTRICT							
	Number	518	4,362	4,880	2,049	1,542	8,471
	Percent	6.1	51.5	57.6	24.2	18.2	100.0
UGASHIK DISTRICT							
	Number	1,508	3,188	4,696	2,102	521	7,319
	Percent	20.6	43.6	64.2	28.7	7.1	100.0
NUSHAGAK DISTRICT							
Wood River	Number	617	80	697	995	17	1,709
	Percent	36.1	4.7	40.8	58.2	1.0	100.0
Igushik River	Number	123	21	144	252	5	401
	Percent	30.7	5.2	35.9	62.8	1.3	100.0
Nuyakuk River	Number	248	77	325	458	2	785
	Percent	31.6	9.8	41.4	58.3	0.3	100.0
Total	Number	988	178	1,166	1,705	24	2,895
	Percent	34.1	6.2	40.3	58.9	0.9	100.0
TOGLAK DISTRICT							
	Number	59	13	72	277	7	356
	Percent	16.6	3.7	20.2	77.8	2.0	100.0
TOTAL BRISTOL BAY							
	Number	4,658	16,690	21,348	9,184	5,764	36,296 2/
	Percent	12.8	46.0	58.8	25.3	15.9	100.0

1/ The inshore run data does not include the 1985 Japanese high seas catch of maturing Bristol Bay sockeye or the 1984 Japanese catch of immatures.

2/ Approximately 333,000 additional sockeye salmon of several minor age classes returning in 1985 are not included in this total.

Table 4. Inshore commercial catch and escapement of sockeye salmon, Bristol Bay, 1985. 1/

District and River System	Number of Fish		
	Catch	Escapement	Total Run
NAKNEK-KVICHAK DISTRICT			
Kvichak River	6,160,498	7,211,046	13,371,544
Branch River	143,859	118,030	261,889
Naknek River	1,831,453	1,849,938	3,681,391
Total	8,135,810	9,179,014	17,314,824
EGEGIK DISTRICT	7,457,295	1,095,192	8,552,487
UGASHIK DISTRICT			
Ugashik River		998,232	
Dog Salmon River		775	
Mother Goose System		7,400	
Total	6,346,489	1,006,407	7,352,896
NUSHAGAK DISTRICT			
Wood River	791,289	939,000	1,730,289
Igushik River	179,068	212,454	391,522
Nuyakuk River	277,104	429,162	706,260
Nushagak-Mul. Sys.	59,032	69,300	128,332
Snake River	16,999	34,880	51,879
Total	1,323,492	1,684,796	3,008,288
TOGIK DISTRICT			
Togiak Lake		136,542	
Togiak River and Tributaries		8,800	
Kulukak System		36,600	
Other Systems		8,140	
Total	210,470	190,082	400,552
TOTAL BRISTOL BAY	23,473,556	13,155,491	36,629,047

1/ Inshore catch and apportionment by river system to the Naknek-Kvichak and Nushagak districts is preliminary, while escapements are final.

Table 5. Offshore test fishing catch indices and estimated inshore daily passage rate of sockeye salmon, Port Moller, Bristol Bay, 1985. 1/

Date	No. of Stations Fished	Sockeye Catch	Running Mean		Sockeye Salmon				Days Lag
			Weight (lbs.)	Length (mm)	Index 2/		Passage Rate 3/		
					Daily	Accum.	Daily	Accum.	
6/10	5								
11	5	9	4.0	539	9	9	58	58	
12	5	5	5.8	546	6	15	37	95	
13	5	17	5.6	541	17	32	109	205	
14	5	29	5.1	537	26	58	168	372	
15	5	74	5.4	540	50	108	317	689	
16	5	88	5.4	539	63	171	399	1,088	
17	5	277	5.3	540	126	297	961	2,258	
18	3	[35]	5.2	540	[40]	337	303	2,556	
19	5	38	5.3	541	44	381	322	2,831	
20	5	23	5.3	541	26	407	184	2,949	
21	5	117	5.4	542	71	478	506	3,455	
22	5	138	5.4	544	82	560	560	3,861	
23	5	114	5.4	545	68	628	461	4,298	
24	0	[58]	5.4	545	[59]	687	399	4,709	
25	2	[73]	5.4	544	[57]	744	385	5,094	
26	5	198	5.4	544	102	846	692	5,786	
27	5	113	5.4	544	66	912	571	8,000	10.0
28	5	246	5.5	544	216	1,128	3,183	16,696	11.0
29	5	163	5.5	546	185	1,313	4,551	32,512	11.5
30	5	164	5.5	546	188	1,501	3,729	29,888	8.0
7/ 1	4	46	5.5	546	35	1,537	769	33,453	9.5
2	5	90	5.6	546	53	1,590	1,149	34,602	9.5
3	5	119	5.6	546	71	1,661	1,525	35,786	10.0
4	5	131	5.6	547	93	1,753	1,931	36,698	10.0
5	5	154	5.6	547	99	1,852	2,123	40,017	10.0
6	5	185	5.6	547	114	1,966	2,510	43,590	9.0
Total	124	2,704	5.6	547	1,966		43,590		

1/ Passage rates are those actually used inseason and adjusted daily as required.

2/ Indices expressed in fish/100 fathom hours and includes interpolations for missed days (in brackets) and stations.

3/ Estimated passage rate is expressed in thousands of fish and is adjusted throughout the season based on catchability and/or lag time.

Table 6. Offshore test fishing catch indices and estimated inshore daily passage rate of chum salmon, Port Moller, Bristol Bay, 1985.

Date	No. of Stations Fished	Chum Catch	Chum Salmon			
			Index 1/		Passage Rate 2/	
			Daily	Accumulative	Daily	Accumulative
6/10	5					
11	5	6	6	6	59	59
12	5	2	2	8	22	81
13	5	4	4	12	41	122
14	5	7	5	17	51	173
15	5	9	6	23	62	234
16	5	7	6	29	56	290
17	5	21	11	40	11	402
18 3/	3	2	3	42	26	428
19	5	1	1	44	12	439
20	5	0	0	44	0	439
21	5	1	1	44	6	445
22	5	3	2	46	18	463
23	5	3	2	48	18	481
24 3/	0	0	0	48	0	481
25 3/	2	0	0	48	0	481
26	5	13	8	55	76	557
27	5	19	12	67	120	677
28	5	9	6	74	65	742
29	5	3	3	76	27	769
30	5	8	11	87	12	881
7/ 1	4	1	1	88	8	889
2	5	5	3	91	29	917
3	5	13	8	99	81	998
4	5	12	8	107	78	1,077
5	5	1	1	107	7	1,084
6	5	24	16	123	160	1,244
Total	124	174		123		1,244

1/ Indices expressed in fish/100 fathom hours.

2/ Estimated passage rate is expressed in thousands of fish, and is based on the historical average of 10,100 fish per adjusted index point (1979 not used in compiling average).

3/ Indices may not represent final interpolation for missed days and stations.

Table 7. Summary of district sockeye salmon test fishing indices in the Naknek-Kvichak district by index area and date, Bristol Bay, 1985. 1/

Index Area	Date							
	June 26	July 6	July 7	July 7	July 8	July 13	July 14	July 20
Naknek River Mouth	840	510 2/	725 2/	2,853	73	286 3/	83 3/	12 2/
Pederson Point	2,520	27		462 4/	724 2/	114	63	4 2/
Cutbank & Graveyard					1,017 2/	923	0	989 2/
Salmon Flats			1,551		0	14		7
Gravel Spit	3	414	1,088	212 2/	312 2/	31		
Ships Anchorage	19	30	14 3/					0
Half Moon Bay	27	284	336	97				
Johnson Hill		364						
Division Buoy	469	117	121 2/	462 2/		138 2/	204	37 2/
Deadman Sands								
Middle Line		1,093	311			44	1,259	0
Low Point		817		1,438			303	
Middle Bluff			704 2/					

1/ All indices expressed in number of fish/100 fathom hours to the nearest full index point.

2/ Average of two consecutive drifts in the same index area.

3/ Average of three consecutive drifts in the same index area.

4/ Average of four consecutive drifts in the same index area.

Table 8. Summary of district sockeye salmon test fishing indices in the Egegik district by index area and date, Bristol Bay, 1985. 1/

Index Area	Date
	July 4
Coffee Point	1,775
Outer Ships Channel	51
South Marker	361
North Marker	413
Two Miles North of North Marker	2,191
Four Miles North of North Marker	312

1/ All indices expressed in number of fish/100 fathom hours to the nearest full index point.

Table 9. Summary of district sockeye salmon test fishing indices in the Nushagak district by index area and date, Bristol Bay, 1985. 1/

Index Area	Date												
	June 27		June 28	June 29	June 30	July 5	July 6	July 7	July 8	July 10		July 11	
	A.M.	P.M.	P.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	A.M.	P.M.	A.M.	P.M.
Nushagak River							720	3,387			161		1,034
Wood River													
Kanakanak Beach	0		0	0 2/	107	206		2,798			0		148
Grassy Island		0 2/	0	0 2/	29 2/	900	120	13,593			0		3,947
Nushagak Point		29 2/	0	0	560	3,840		901	7,680		168 2/		2,269
Coffee Point					31	0	576						
Combine Flats		24 2/	0 3/	411	224	2,496	0	880	84		2,748 2/		812
Snake R. Flats			0										
Clarks Point		31 4/	0	152		1,536					33 2/		436
Ekuk Bluff		51 4/	170 3/	241 2/		1,067 3/		4,289			1,888 2/		1,261 2/
Schooner Ch. N.W.			84	0							571 3/		19
Schooner Ch. S.E.													
Ships Ch. N.W.		0	5,520	192									0
Ships Ch. S.E.													
Middle Ch. N.W.		0	3,600	2,304									0
Middle Ch. S.E.													
West Ch. N.W.		0	1,456 2/	800									0
West Ch. S.E.													
Dead Man's Spit													
Nichols Spit													

1/ All indices expressed in number of fish/100 fathom hours to the nearest full index point.

2/ Average of two consecutive drifts in the same index area.

3/ Average of three consecutive drifts in the same index area.

4/ Average of four consecutive drifts in the same index area.

Table 10. Daily king salmon catch per unit of effort in subsistence nets at Kanakanak Beach and Lewis Point, Nushagak district, 1985.

			Catch Per Unit of Effort 3/			
			Kanakanak Beach		Lewis Point	
Wind 2/						
Date 1/	Direction	Knots	CPUE	Effort 4/	CPUE	Effort 5/
6/ 2	N	0- 5	0	20		
3	NNW	0-10	+	20		
3	NE	0- 5	0	20		
4	NE	0-15	0	22		
4	NE	0- 5	0	21		
5	NE	0- 6	+	21		
5			0	24		
6			0	23		
6	WSW	0- 5	0	24		
7	S	0-15	0	24		
8	NE	0- 5	0	24		
9	ENE	0- 5	0	25		
9	NE	0- 5	0	25		
10		Calm	0	20	0	1
10	NE	5-15	0	23	0	1
11	NW	0- 5	0	20	0	2
11	S	10-15	0	22	0	1
12		Calm	0	26	0	1
12	SW	10-15	+	23	0	1
13	NNW	0- 5	1.2	16	34.0	1
13	SE	0- 5	0.6	13	2.3	3
14		Calm	0	28	0.4	5
14			0	21	0	5
15	SW	0- 5	0	27	0	5
15	S	0- 5	0	25	0.2	5
16					0	6
16					0	4
17					0	7
17	SW	10-17	0	12	0	4
18					0	7
18					0	4
19	SE	0-10	1.5	2	7.3	7
19	SE	0- 5	5.8	8	0	5
20		0- 5	0	3	8.7	9
20					0	3

(continued)

Table 10. (continued)

Date 1/	Wind 2/ Direction	Knots	Catch Per Unit of Effort 3/			
			Kanakanak Beach		Lewis Point	
			CPUE	Effort 4/	CPUE	Effort 5/
6/21					0.8	9
21	SW	0- 5	0.1	8	0	5
22	SW	0- 5	1.2	5	8.4	9
22					0	3
23					0.3	9
23					0	4
24					0	8
24	SE	0- 5	0	2		
25	SW	0- 5	0	6	0	6
25					0.3	8
26					0.1	8
26	S	0- 2	0	4	1.5	8
27	SW	0- 2	0	13	0.8	8
27					0.4	8
28					0.4	8
28		0- 5	0	5	0.1	9
29	S	0- 2	0	9	0	9
29					0.1	9
30					4.4	7
Season Average CPUE and Effort			0.3	17	1.8	6

1/ Catches recorded at low water when nets are picked.

2/ As recorded on Kananak Beach at time of survey.

3/ Average number of kings per net (CPUE) at Kananak Beach in Dillingham, and at the lower fish camp location at Lewis Point on Nushagak River.

4/ Total subsistence nets fishing on Kananak Beach.

5/ Subsistence nets (index and non-index) monitored for CPUE.

Table 11. Emergency order commercial salmon fishing periods, Commissioner's announcements, and general announcements, by district, Bristol Bay, 1989.

I. Emergency Orders 1/

Number	Date and Time				Hours/Days Open
<u>NAKNEK-KVICHAK DISTRICT</u>					
AKN 07	June 30	8:00 a.m.	to June 30	8:00 p.m.	12 hrs.
<u>Kvichak Section Only</u>					
AKN 08	June 30	8:00 p.m.	to July 1	8:00 a.m.	12 hrs. 3/
AKN 10	July 2	10:00 a.m.	to July 2	10:00 p.m.	12 hrs. 3/
AKN 22	July 8	4:00 p.m.	to July 9	4:00 a.m.	12 hrs. 3/
AKN 24	July 9	4:00 a.m.	to July 9	4:00 p.m.	12 hrs. 3/
AKN 26	July 9	4:00 p.m.	to July 10	4:00 a.m.	12 hrs. 3/
AKN 27	July 10	4:00 a.m.	to July 10	6:00 p.m.	14 hrs. 3/
AKN 38	July 17	9:00 a.m.	to July 20	9:00 a.m.	3 days 5/
<u>Naknek Section Only</u>					
AKN 03	June 28	7:00 a.m.	to June 28	7:00 p.m.	12 hrs.
AKN 04	June 28	7:00 p.m.	to June 29	7:00 a.m.	12 hrs.
AKN 08	June 30	8:00 p.m.	to July 1	8:00 a.m.	12 hrs.
AKN 10	July 2	10:00 a.m.	to July 2	10:00 p.m.	12 hrs.
AKN 12	July 2	10:00 p.m.	to July 3	10:00 p.m.	24 hrs. 3/
AKN 13	July 3	10:00 p.m.	to July 5	12:00 NOON	38 hrs. 3/
	July 4	12:00 NOON	to July 5	12:00 NOON	24 hrs. 4/
AKN 22	July 8	4:00 p.m.	to July 9	4:00 a.m.	12 hrs.
AKN 24	July 9	4:00 a.m.	to July 9	4:00 p.m.	12 hrs.
AKN 26	July 9	4:00 p.m.	to July 10	4:00 a.m.	12 hrs.
AKN 27	July 10	4:00 a.m.	to July 10	6:00 p.m.	14 hrs.
AKN 28	July 10	6:00 p.m.	to July 11	6:00 p.m.	24 hrs. 3/
	July 10	6:00 p.m.	to July 11	6:00 p.m.	24 hrs. 4
AKN 31	July 11	6:00 p.m.	to July 12	7:00 p.m.	25 hrs. 3/
	July 11	6:00 p.m.	to July 12	7:00 p.m.	25 hrs. 4/
AKN 38	July 17	9:00 a.m.	to July 20	9:00 a.m.	3 days 4/
AKN 39	July 17	9:00 p.m.	to July 20	9:00 a.m.	2 days, 12 hrs. 5/
<u>EGEGIK DISTRICT</u>					
AKN 01	June 15	12:00 NOON	to Sept. 30	12:00 MN	- 2/
AKN 02	June 27	4:00 a.m.	to June 27	4:00 p.m.	12 hrs.
AKN 05	June 29	6:00 a.m.	to June 29	6:00 p.m.	12 hrs.
AKN 06	June 29	6:00 p.m.	to June 30	7:00 p.m.	25 hrs.
AKN 09	July 2	9:00 a.m.	to July 2	9:00 p.m.	12 hrs.

(continued)

Table 11. (continued)

I. Emergency Orders 1/

Number	Date and Time				Hours/Days Open	
<u>EGEGIK DISTRICT (continued)</u>						
AKN 15	July 5	12:00 NOON	to	July 5	12:00 MN	12 hrs.
AKN 16	July 5	12:00 MN	to	July 6	12:00 MN	24 hrs.
AKN 18	July 6	12:00 MN	to	July 7	12:00 NOON	12 hrs.
AKN 20	July 7	12:00 NOON	to	July 8	2:00 p.m.	26 hrs.
AKN 25	July 9	5:00 p.m.	to	July 10	5:00 p.m.	24 hrs.
AKN 30	July 11	6:00 p.m.	to	July 12	6:00 p.m.	24 hrs.
AKN 32	July 11	6:00 p.m.	to	July 17	9:00 a.m.	5 days, 15 hrs.
AKN 40	Monday	9:00 a.m.	to	Friday	9:00 a.m.	- 6/
<u>UGASHIK DISTRICT</u>						
AKN 02	June 27	4:00 a.m.	to	June 27	4:00 p.m.	12 hrs.
AKN 05	June 29	6:00 a.m.	to	June 29	6:00 p.m.	12 hrs.
AKN 06	June 29	6:00 p.m.	to	June 30	7:00 p.m.	25 hrs.
AKN 09	July 2	9:00 a.m.	to	July 2	9:00 p.m.	12 hrs.
AKN 11	July 2	9:00 p.m.	to	July 3	9:00 p.m.	24 hrs.
AKN 14	July 5	1:00 p.m.	to	July 6	1:00 a.m.	12 hrs.
AKN 17	July 6	1:00 a.m.	to	July 7	1:00 a.m.	24 hrs.
AKN 19	July 7	1:00 a.m.	to	July 8	2:00 a.m.	25 hrs.
AKN 21	July 8	2:00 a.m.	to	July 9	3:00 a.m.	25 hrs.
AKN 23	July 9	3:00 a.m.	to	July 10	4:00 a.m.	25 hrs.
AKN 29	July 11	5:00 a.m.	to	July 11	5:00 p.m.	12 hrs.
AKN 33	July 12	8:00 p.m.	to	July 13	7:00 a.m.	11 hrs.
AKN 34	July 13	7:00 a.m.	to	July 13	7:00 p.m.	12 hrs.
AKN 35	July 13	7:00 p.m.	to	July 14	7:00 p.m.	24 hrs.
AKN 36	July 15	8:00 p.m.	to	July 16	9:00 p.m.	25 hrs.
AKN 37	July 16	9:00 p.m.	to	July 17	9:00 a.m.	12 hrs.
AKN 40	Monday	9:00 a.m.	to	Friday	9:00 a.m.	- 6/
<u>NUSHAGAK DISTRICT</u>						
DLG 01	June 8	9:00 a.m.	to	July 17	9:00 a.m.	- 7/
DLG 02	June 14	10:00 a.m.	to	June 14	10:00 p.m.	12 hrs.
DLG 03	June 20	4:00 a.m.	to	June 20	4:00 p.m.	12 hrs.
DLG 23	Monday	9:00 a.m.	to	Tuesday	9:00 p.m.	36 hrs. 9/
	Thursday	9:00 p.m.	to	Saturday	9:00 a.m.	36 hrs. 9/
DLG 24	Aug. 1	9:00 p.m.	to	Sept. 30	12:00 MN	60 days, 3 hrs. 5/
<u>Nushagak Section Only</u>						
DLG 04	June 30	10:00 a.m.	to	June 30	10:00 p.m.	12 hrs. 8/
DLG 05	July 2	12:00 NOON	to	July 2	12:00 MN	12 hrs. 8/
DLG 06	July 4	2:00 p.m.	to	July 5	2:00 a.m.	12 hrs. 8/

(continued)

Table 11. (continued)

I. Emergency Orders 1/

Number		Date and Time				Hours/Days Open
<u>NUSHAGAK DISTRICT (continued)</u>						
<u>Nushagak Section Only</u>						
DLG 07	July 6	4:00 p.m.	to	July 7	4:00 a.m.	12 hrs.
DLG 09	July 8	6:00 p.m.	to	July 9	6:00 a.m.	12 hrs.
DLG 18	July 15	11:00 a.m.	to	July 15	11:00 p.m.	12 hrs.
DLG 19	July 15	11:00 p.m.	to	July 16	11:00 a.m.	12 hrs.
DLG 20	July 16	11:00 a.m.	to	July 17	9:00 a.m.	22 hrs.
<u>Igushik Section Only</u>						
DLG 04	June 30	10:00 a.m.	to	June 30	10:00 p.m.	12 hrs. 3/8/
DLG 05	July 2	12:00 NOON	to	July 2	12:00 MN	12 hrs. 3/8/
DLG 06	July 4	2:00 p.m.	to	July 5	2:00 a.m.	12 hrs. 3/8/
DLG 07	July 6	4:00 p.m.	to	July 7	4:00 a.m.	12 hrs. 3/
DLG 09	July 8	6:00 p.m.	to	July 9	6:00 a.m.	12 hrs. 3/
DLG 10	July 10	7:00 a.m.	to	July 10	7:00 p.m.	12 hrs. 3/
DLG 11	July 10	7:00 p.m.	to	July 11	7:00 p.m.	24 hrs. 3/
DLG 12	July 11	7:00 p.m.	to	July 12	7:00 p.m.	24 hrs. 3/
DLG 14	July 12	7:00 p.m.	to	July 13	7:00 p.m.	24 hrs. 3/
DLG 15	July 13	7:00 p.m.	to	July 14	7:00 p.m.	24 hrs.
DLG 16	July 14	7:00 p.m.	to	July 17	9:00 a.m.	2 days, 14 hrs.
<u>TOGIK DISTRICT</u>						
DLG 25	Monday	9:00 a.m.	to	Tuesday	9:00 a.m.	24 hrs. 10/
	Friday	9:00 a.m.	to	Saturday	9:00 a.m.	24 hrs. 10/
DLG 26	Aug. 26	9:00 a.m.	to	Sept. 30	12:00 MN	35 days, 15 hrs. 5/
DLG 27	Aug. 28	9:00 a.m.	to	Aug. 29	9:00 a.m.	24 hrs.
DLG 28	Sept. 4	9:00 a.m.	to	Sept. 4	9:00 a.m.	24 hrs.
<u>Togiak River Section Only</u>						
DLG 08	July 8	9:00 a.m.	to	July 9	9:00 a.m.	24 hrs. 5/
DLG 13	July 11	6:00 p.m.	to	July 15	9:00 a.m.	3 days, 15 hrs. 5/
DLG 17	July 15	9:00 a.m.	to	July 22	9:00 a.m.	7 days 5/
DLG 21	July 22	9:00 a.m.	to	July 29	9:00 a.m.	7 days 5/
DLG 22	July 26	9:00 p.m.	to	July 29	9:00 a.m.	2 days, 12 hrs.

(continued)

Table 11. (continued)

I. Emergency Orders 1/

Number	Date and Time				Hours/Days Open
<u>TOGLIAK DISTRICT (continued)</u>					
<u>Kulukak Section Only</u>					
DLG 08	July 8	9:00 a.m.	to July 10 9:00 a.m.		48 hrs. 5/
DLG 13	July 11	6:00 p.m.	to July 15 9:00 a.m.	3 days,	15 hrs. 5/
DLG 17	July 15	9:00 a.m.	to July 22 9:00 a.m.		7 days 5/
DLG 21	July 22	9:00 a.m.	to July 29 9:00 a.m.		7 days 5/
DLG 22	July 26	9:00 a.m.	to July 29 9:00 a.m.	2 days,	12 hrs.

II. Commissioner's Announcements 1/

Number/Date	Description
AKN 01-85 July 11 6:00 p.m.	Waives the 24 hour waiting period for district transfers, changing type of gear fished, and relocation of set net sites in Egegik district as required under 5 AAC 06.370.
AKN 02-85 July 16 9:00 a.m.	Waives the 24 hour waiting period for district transfers, changing type of gear fished, and relocation of set net sites in Ugashik district as required under 5 AAC 06.370.

III. General Announcements 1/

Number/Date	Description
AKN 01 June 24 7:00 p.m.	This is the ADF&G with the status of the salmon run in the Naknek/Kvichak, Egegik, and Ugashik districts. Very little escapement has occurred in the rivers as of this date. Inside test fish programs, aerial surveys and towers are continuing to monitor the escapement. False Pass catches have been fairly strong and the Port Moller test boat has continued to make fair catches. We will be in a holding pattern until fish begin to move into the rivers in adequate numbers. There is no solid evidence at this time that the run will vary much either way from the 35 million forecast.

(continued)

Table 11. (continued)

III. General Announcements 1/

Number/Date	Description
AKN 02 June 25 7:15 p.m.	This is the ADF&G with an informational announcement on the status of the salmon run. There is still minimal escapement in all systems. The Port Moller test boat was unable to fish yesterday because of bad weather and only managed two drifts today before having to quit. Inside test fish indices and tower counts remain very low at this time. Once fish begin to move into the rivers we will contemplate openings, however, until that time fishing will remain closed.
AKN 03 July 5 9:00 p.m.	This is the ADF&G with an informational announcement on the status of the Kvichak and Naknek Rivers. The Kvichak escapement past the tower through 6 p.m. today was 1.8 million with an additional 300,000 estimated in the river. The inside test fish indices have been low the past four tides although some fish movement has begun to occur on this evenings tide. The Naknek River escapement was 779,000 through 6 p.m. today. The Port Moller test boat is continuing to catch fish with no apparent sharp dropoff in the run. An outside test fish boat is being dispatched to monitor fish movement and numbers throughout the districts.
AKN 04 July 6 6:00 p.m.	This is the ADF&G with an informational announcement concerning the Kvichak and Naknek River runs. The Kvichak escapement through 2 p.m. this afternoon was 2.1 million with an additional 600-700,000 fish in the river. This escapement is 28% of the escapement goal and is several days behind schedule. Normal peak timing for the Kvichak run is between July 4-8 while that for the Naknek is between July 1-5. The largest percentage of fish entering the district at this time would be expected to be of Kvichak River origin. The Naknek escapement through 2 p.m. today was 813,000. District test boats will be fishing to monitor numbers and movement of fish within and outside the district. Information available at this time indicates that any opening in the district might be at least 3 tides or more away.

(continued)

Table 11. (continued)

III. General Announcements 1/

Number/Date	Description
AKN 05 July 7 6:00 p.m.	This is the ADF&G with an informational announcement for the Kvichak and Naknek Rivers. The Kvichak escapement through 2 p.m. today was 2.6 million. An attempt to aerial survey the river was made this afternoon but heavy rains have made streams flowing into the Kvichak extremely muddy and an accurate count below them was not possible. Outside test fish boats generally have made better catches than yesterday. The morning inside test drift was fairly strong. The Naknek escapement through 2 p.m. was 955,000. There will be no announcement at this time.
AKN 06 July 13 9:00 p.m.	This is the ADF&G with an informational announcement on the status of the Kvichak River. The escapement past the tower through 6 p.m. this evening was 6 million. Inside test fish indices have been improving, but not enough at this time to indicate any substantial increase in numbers. An aerial survey late this afternoon resulted in an inriver estimate of between 500 and 600,000. We are still over 3 million short of the 10 million goal established for the river. Until another 2 million fish can be accounted for in the Kvichak escapement, the Kvichak will remain closed. The Naknek River escapement is 1.6 million at this time, however, this section will remain closed in order to protect Kvichak fish migrating on the east side of the Bay. If large numbers of Naknek fish begin entering the river, a fishing period may be necessary at a later date. If only small numbers enter the escapement, we will keep the section closed.
AKN 07 July 14 9:00 p.m.	This is the ADF&G with an informational announcement on the status of the Kvichak and Naknek Rivers. The Kvichak escapement through 6:00 p.m. this evening was 6.3 million with an additional 300-400,000 in the river. Inside test fish catches have not increased during the last two tides and a district test fishing boat indicates there is no large buildup or movement of fish within or below the district. It is likely that if results tomorrow indicate the same trend, the Kvichak section closure will be extended until 9 a.m., July 22. The Naknek escapement has not shown a substantial increase at this time and is presently averaging 3,100 fish per hour past the tower. If the escapement does not significantly increase over the present rate, the section will remain closed until 9 a.m., July 17. The present escapement through 6 p.m. is 1.7 million.

(continued)

Table 11. (continued)

III. General Announcements 1/

Number/Date	Description
DLG 01 June 5 9:00 a.m.	The Igushik River sockeye salmon forecast this season is 307,000. Escapement requirements are 200,000, leaving a harvest of only 107,000 fish if the run comes in right at forecast. With the small allowable harvest, it is our intention to conduct a "set net" only fishery early in the season to help determine actual run strength. Fishing time will be minimal until the actual run strength can be determined. If run strength develops and the actual sockeye return is well above forecast, both gear types can participate, but until run strength can be determined, we will allow a "set net" fishery only, as permitted by Board of Fisheries regulation 5 AAC 06.320 (f).
DLG 02 June 12 9:00 a.m.	This is the ADF&G with an update on the status of the Nushagak king salmon fishery. The total harvest of king salmon to date is 10,500. The subsistence nets at Kanakanak beach and Lewis Pt. have had a catch of zero king salmon the past four days. The sonar at Portage Creek is now fully operational and has recorded no king escapement. Test drifts at Portage Creek have netted zero kings in 24 drifts. The Nushagak district remains closed to salmon fishing until further notice. Monitoring of the subsistence nets at Lewis Pt. and Kanakanak beach will continue at each tide. Daily updates of the fishery will be posted.
DLG 03 June 23 9:00 a.m.	The following is an informational announcement regarding the Nushagak district king salmon fishery. The total commercial harvest through the last fishing period on June 20 is 21,000 fish. The long-term average harvest through June 23 is 57,000 from all years where we have comparative catch data (1958-84). This season's catch is comparable to a 6 year average of 22,000 when the run was either weak or showing extremely late run timing. At this point in the run we do not know if it will make the forecast of 179,000. Age composition of the commercial catch is comparable to the forecast, but it may be that all age classes will be under forecast. Escapement, as determined by our Portage Creek sonar counter is 9,100 through June 22, with most of this escapement coming on June 20 (2,700), June 21 (3,900 and June 22 (1,800). Escapement monitoring is continuing at Portage Creek, as well as subsistence net checks at Kanakanak beach and Lewis Pt. King salmon escapement requirements total 50 to 100,000, with a point goal of 75,000. If the run is less than forecast, it will be necessary to obtain escapement require-

(continued)

Table 11. (continued)

III. General Announcements 1/

Number/Date	Description
DLG 03 (cont.)	<p>ments within the next 4 to 5 days, or the king run will begin to seriously back into early arriving sockeye salmon. The Nushagak sockeye salmon forecast is not as strong as previous years, and early season fishing time was anticipated to be minimal. This anticipated fishing schedule will also benefit king escapement. Further fishing time in the Nushagak district will be dependent upon a substantial showing of king salmon in the escapement.</p>
DLG 04 June 24 12:00 Noon	<p>This is the ADF&G with an update on the status of the Nushagak district king fishery. At this time there is no substantial change in the status of the Nushagak king salmon run. Yesterday's Portage Creek count of 3,600 brought the total king escapement to 12,600. This morning's count of 1,000 total counts through 10 a.m. is well below the previous day's total count of 3,700 through 10 a.m. The Lewis Pt. subsistence nets also confirm the daily escapement rate is decreasing. The Nushagak fishery will remain on hold.</p>
DLG 05 June 28 5:00 p.m.	<p>This is the ADF&G with an informational announcement concerning the Nushagak fishery. The Nushagak district outside test fish boat is presently on her second consecutive trip in as many days. Yesterday's total of 18 separate sets from inside the district at Grassy Island to Ekuk Bluff showed very little fish movement (only 55 fish in 18 sets). Today's test fishing trip has produced only 12 fish in 7 sets from inside at Grassy Island/Nushagak Point to Ekuk Bluff, showing conclusively that the main body of fish in the outer district have not yet begun to move inriver. With no escapement in Wood River and only 3,400 sockeye salmon past the Nushagak sonar site, additional closure is anticipated. We will be conducting daily test fishing within the upper district to document fish movement. With the apparent fish strength in the outer district, we expect the inriver movement to not delay much longer. Please standby for daily updates, don't take an extended weekend trip and be patient.</p>

(continued)

Table 11. (continued)

III. General Announcements 1/

Number/Date	Description
DLG 06 June 29 6:00 p.m.	<p>This is the ADF&G with a status report concerning the Nushagak district fishery. Test boat catches in the district show a good volume of fish present in the outer areas but no appreciable movement into the lower rivers. Reliable reports of fish sightings this morning indicate that a volume of fish moved up as far as Queen Slough and above, but it appears that they stopped their upward migration at that point and rode the ebb back into the main part of the district. There is no doubt at this time that there is a good quantity of fish in the area, the question is, when will they begin their migration into the rivers? It has been the expressed intent of the staff all season to ensure some early escapement into both Nuyakuk and Wood Rivers. Sonar estimates at Portage Creek today indicate a very low passage of fish at their site and an aerial survey of Wood River this afternoon sighted a total of 30 fish in the river. It is our best assessment at this time that we are very close to a fishery in the Nushagak district, possibly as early as 10 a.m. tomorrow. We are putting all fishermen on short notice and encouraging everyone to get off the beaches on the big early morning tide tomorrow and standby for a possible short notice announcement. We are sending the test boat out again on the ebb in the morning to determine if the fish are finally beginning to move. An early morning aerial survey is also planned and all of these results will determine where we will go from here. When we do go fishing next opening, only small mesh gear will be allowed in the hope that further protection will be afforded to the king salmon run.</p>
DLG 07 July 9 11:00 a.m.	<p>This the ADF&G with an informational update on the status of the Nushagak sockeye salmon fishery. The Nushagak district closed to salmon fishing at 6 a.m., Tuesday, July 9. Escapement past the Wood River tower is 507,000 as of 6 a.m. this morning with an additional 20,000 fish observed in the lower river. This last period's catch is estimated at 80,000 sockeye, well below the previous period on July 6 which had a catch of 372,000 sockeye. At this time the Nushagak district is closed until further notice pending increased sockeye salmon escapement.</p>

(continued)

Table 11. (continued)

III. General Announcements 1/

Number/Date	Description
DLG 08 July 12 4:00 p.m.	This is the ADF&G with a general announcement concerning the status of the fishery in the Nushagak district. The sockeye catch as of July 11 stands at 1.1 million and with the present rate of escapement, it appears that the run to this district will fall well below the forecast of 3.3 million. Test boat catches on July 11 were spotty and aerial surveys continue to confirm reduced numbers of fish entering the (3) major river systems. Wood River tower counts total 667,000 as of 2 p.m. July 12, well below the season's goal of 1.0 million. The Nuyakuk River escapement totals 231,000 also well below the goal of 500,000. The Igushik River escapement of 179,000 is approaching the goal of 200,000, although the counts are dropping the past two days. It appears that an extensive closure will be necessary at this time in the Nushagak section to bring both the Wood and Nuyakuk escapements into the lower management range. An additional closure after the emergency order period on July 17 through the weekend of July 20-21 is probable if escapement(s) to these 2 systems remain low.
DLG 09 Aug. 1 9:00 a.m.	This is the ADF&G with an announcement concerning fishing time in the Nushagak district. Through Tuesday, July 30, the district catch stands at 18,000 coho, well below the average catch of 53,000 through this date. Escapement as determined at the Portage Creek sonar site is only 1,900 fish while escapement requirements total 150,000. Catch and escapement rates of coho salmon this season are projecting a total run of 55,000 to 135,000. If the coho run does total 135,000, it would still be below escapement needs. The apparent weak coho run is also substantiated by coho catches in the cape intercept fishery at Popof Head in the Shumagin Islands. This fishery is showing a relatively low catch, comparable to catches made in 1983, when all of western Alaska and Bristol Bay experienced a weak coho run. With the apparent poor coho run prognosis, the 36 hour fishing period scheduled for August 1-3 is cancelled, and the Nushagak district will remain closed until further notice. If coho escapement rates improve considerably, additional fishing time will be allowed.

(continued)

Table 11. (continued)

III. General Announcements 1/

Number/Date	Description
DLG 10 Aug. 6 12:00 NOON	This is the ADF&G with a status report on the Nushagak district coho fishery. The coho escapement rate at the Nushagak River sonar site has begun to improve from fish that moved through the fishery over the weekend. However, the improvement was marginal at best. The daily passage of coho for Monday, August 5 was 4,100, bringing the accumulative escapement up to 6,200 fish. Tuesday morning's rate would indicate another 6 to 8,000 coho escapement for August 6. Monday evening's aerial survey of Nushagak River below the sonar site confirmed the low passage rate and the lack of schooled fish in the river. Total run projection currently range between 55 to 100,000 coho. A run of this size would be less than escapement requirements and would necessitate continued closure of the fishery. Monitoring of the coho escapement will continue and we will update this message if the run situation changes.
DLG 11 Aug. 9 4:30 p.m.	This is the ADF&G with an updated status report on the Nushagak district coho fishery. The coho escapement rate at the Nushagak River sonar site improved considerably on Thursday, August 8 when over 22,000 coho passed the sonar units, bringing the accumulative escapement up to 38,000 fish. Friday morning's hourly rate indicated another strong daily escapement would occur, but that rate has begun to decrease significantly this afternoon. It appears that today's escapement will approximate only 8,000 to 12,000 fish. If the daily escapement(s) continue to decrease through this coming weekend, continued closure of the fishery will be necessary. Monitoring of the coho escapement will continue and we will update this message as the run situation changes.
DLG 12 Aug. 16 4:30 p.m.	This is the ADF&G with an updated status report on the Nushagak district coho fishery. The coho escapement rate at the Nushagak River sonar site is now running between 4,000 and 8,000 fish per day. The accumulative escapement through Thursday, August 15 is 78,000 fish. It appears that today's escapement will approximate only 2,000 to 4,000 fish. If the daily escapements continue to decrease or to maintain a low daily passage rate through this coming weekend, continued closure of the fishery will be necessary to obtain escapement needs. Monitoring of the coho escapement will continue and we will update this message if the run situation changes significantly.

(continued)

Table 11. (continued)

III. General Announcements 1/

Number/Date	Description
1/	Prefix code on emergency orders and Commissioner's announcements and general announcements indicate where announcements originated ("AKN" for the King Salmon field office and "DLG" for the Dillingham field office).
2/	This emergency order established the north Egegik district boundary line by Loran C coordinates.
3/	Set net gear only.
4/	Fishing with drift net gear only allowed south of Loran C line 9990-Y-32370.
5/	Closed to fishing..
6/	Reduces the regular five-day weekly fishing schedule to four-days per week effective August 27, 12:00 NOON.
7/	This emergency order amended the weekly fishing schedule by advancing the period regulated by emergency order, and closes the area south of the sockeye salmon boundary line, both effective June 8, 9:00 a.m.
8/	Large mesh king salmon gill net gear prohibited.
9/	Reduces the regular five-day weekly fishing schedule to two 36 hour fishing periods per week effective July 29, 9:00 a.m.
10/	Reduces the regular 4 and 5 day weekly fishing schedule to two 24 hour fishing periods per week effective August 19, 9:00 a.m.

Table 12. Daily district registration of drift gill net permit fishermen by district, Bristol Bay, 1985.

Date	District Registration by District					Total
	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	
6/15	430	247	80	485 1/	64	1,306
16 2/						
17 2/						
18	488	384	96	434	70	1,472
19	570	425	89	336	70	1,490
20	627	440	92	316	68	1,543
21	641	450	92	325	68	1,576
22 2/						
23	612	474	100	323	68	1,577
24	587	550	124	303	62	1,626
25	579	612	144	257	64	1,656
26	584	619 1/	157	250	63	1,673
27	725	504	157	255	65	1,706
28	638	613	150	256	65	1,722
29	815 1/	444	145	252	65	1,721
30	810	454	157	237	65	1,723
7/ 1	760	523	179	207	66	1,735
2 2/						
3	716	437	297	227	66	1,743
4	716	437	297	227	66	1,743
5	665	392	381	239	66	1,743
6	681	416	351	239	66	1,753
7	686	416	354	232	67	1,755
8	675	400	368	243	67	1,753
9	606	426	410	247	67	1,756
10	628	379	456	227	67	1,757
11	607	342	534	211	68	1,762
12	610	300	629 1/	159	85	1,783
13	652	313	584	149	86 1/	1,784
14	641	397	504	155	86 1/	1,783
15	588	271	452	387	85	1,783
16	677	273	425	323	85	1,783
17	681	276	426	347	86 1/	1,816

1/ Peak registration dates in each district.

2/ Records not retained.

NOTE: These data include dummy transfer files for 32 permittees who retained both copies of their blue cards and hence did not show up in the blue card file (1.7% of the total drift permit roster). They show up in the July 17 final entry only.

Table 13. Commercial salmon catch by period and species, Naknek-Kvichak district, Bristol Bay, 1985.

Period	Time	Effort 1/		Number of Fish					
		Drift	Set	Sockeye	King	Chum	Pink	Coho	Total
6/ 3- 8	5 days			2	11				13
10-15	5 days			1,344	244	18			1,606
17-22	5 days			134,081	1,281	3,493			138,855
28	17 hrs.	780	187	1,174,829	155	9,444			1,184,428
29	7 hrs.			368,633	144	2,897			371,674
30	16 hrs.	810	356	1,360,327	636	12,486			1,373,449
7/ 1	8 hrs.			428,360	226	4,515			433,101
2	14 hrs.	750	356	812,107	250	7,710			820,067
3	24 hrs.			39,130	60	439			39,629
4	24 hrs.	720	201	745,186	150	6,082			751,418
5	12 hrs.			451,425	95	3,495			455,015
8	8 hrs.	650	356	243,091	41	2,405			245,537
9	24 hrs.			498,176	117	5,458			503,751
10	24 hrs.			385,628	170	4,286			390,084
11	24 hrs.	600	201	479,226	146	5,043			484,415
12	17 hrs.			735,273	178	8,407			743,858
17	12 hrs.	292	125	69,101	130	2,033			71,264
22-27	5 days			201,888	1,055	71,339	6	404	274,692
29-8/3	5 days			6,870	631	20,566	21	3,640	31,728
5-10	5 days			1,021	160	5,380		2,529	9,090
12-17	5 days			112	11	102		1,133	1,358
Total				8,135,810	5,891	175,598	27	7,706	8,325,032
Percent of District Catch				97.7	0.1	2.1	+	0.1	100.0

1/ Estimated fishing effort based on aerial surveys.

Table 14. Commercial salmon catch by period and species, Egegik district, Bristol Bay, 1985.

Period	Time	Effort 1/		Number of Fish				Coho	Total
		Drift	Set	Sockeye	King	Chum	Pink		
6/ 3	15 hrs.			4	9				13
4	24 hrs.			13	1				14
5	24 hrs.			20	2	1			23
6	24 hrs.			16	1	1			18
7	24 hrs.			11	1	1			13
8	9 hrs.			1	2	5			8
10	15 hrs.			338	22	11			371
11	24 hrs.	3	10	531	31	20			582
12	24 hrs.			1,092	69	87			1,248
13	24 hrs.			3,594	146	73			3,813
14	24 hrs.			1,877	25	55			1,957
15	9 hrs.			2,146	67	31			2,244
17	15 hrs.	210	111	23,812	151	623			24,586
18	24 hrs.			39,383	238	869			40,490
19	24 hrs.			29,740	257	676			30,673
20	24 hrs.			18,066	162	499			18,727
21	24 hrs.			265,062	388	5,552	2		271,004
22	9 hrs.	300	200	80,537	160	1,403			82,100
27	12 hrs.	679	190	873,040	233	8,362			881,635
29	18 hrs.	629	209	1,146,110	185	7,877			1,154,172
30	19 hrs.			804,198	211	8,093			812,502
7/ 2	12 hrs.	500	212	592,284	193	4,601			597,078
5	12 hrs.			542,309	144	5,756			548,209
6	24 hrs.	191	205	387,347	84	3,823			391,254
7	24 hrs.			702,503	226	9,246			711,975
8	14 hrs.			378,320	67	4,964			383,351
9	7 hrs.			58,335	31	1,310			59,676
10	17 hrs.			454,202	86	8,240			462,528
11	6 hrs.	339	200	42,220	10	1,323			43,553
12	24 hrs.			391,237	109	8,004			399,350
13	24 hrs.			165,056	34	4,409			169,499
14	24 hrs.	270	180	113,348	53	2,951			116,352
15	24 hrs.			63,798	52	2,720		1	66,571
16	24 hrs.			63,576	37	2,569			66,182
17	24 hrs.			42,999	92	1,357			44,448
18	24 hrs.			52,617	21	1,162		2	53,802
19	24 hrs.			53,110	25	2,208		1	55,344
20	9 hrs.			14,377	19	476			14,872
22	15 hrs.			16,592	13	2,787		92	19,484
23	24 hrs.	30		14,318	30	1,673		157	16,178
24	24 hrs.			7,060	20	1,135		262	8,477

(continued)

Table 14. (continued)

Period	Time	Effort 1/		Number of Fish					
		Drift	Set	Sockeye	King	Chum	Pink	Coho	Total
7/25	24 hrs.			2,867	12	599		252	3,730
26	24 hrs.			3,820	31	630		338	4,819
27	9 hrs.	12	20	1,041	3	194		176	1,414
29	15 hrs.			968	20	376		526	1,890
30	24 hrs.			1,222	11	528	4	781	2,546
31	24 hrs.			596	8	331	3	890	1,828
8/ 1	24 hrs.			282	8	250	2	949	1,491
2	24 hrs.			280	7	355	3	1,266	1,911
3	9 hrs.			128	3	78	1	355	565
5	15 hrs.			332	4	368	4	2,430	3,138
6	24 hrs.			212	7	293	10	1,624	2,146
7	24 hrs.			22	2	17	1	267	309
8	24 hrs.			26	2	71		333	432
9	24 hrs.			13	2	40	1	111	167
10	9 hrs.			18		7		96	121
12	15 hrs.			53	3	155	1	1,932	2,144
13	24 hrs.			110	4	134	1	2,994	3,243
14	24 hrs.			17	1	67		1,555	1,640
15	24 hrs.			11	1	100	2	1,748	1,862
16	24 hrs.			7	2	93	2	1,508	1,612
17	9 hrs.			2		20	1	311	334
19	15 hrs.			18		32	1	1,092	1,143
20	24 hrs.			10	2	16	2	894	924
21	24 hrs.			10		19	2	1,144	1,175
22	24 hrs.			5	1	28	1	1,593	1,628
23	24 hrs.			12	2	13		616	643
24	9 hrs.			3	1			112	116
26	15 hrs.			1		12	5	1,498	1,516
27	24 hrs.			4		3		1,319	1,326
28	24 hrs.			2		4	1	1,167	1,174
29	24 hrs.			2		2	1	1,377	1,382
30	9 hrs.			2				241	243
9/ 2- 6	4 days							252	252
9-13	4 days							470	470
Total				7,457,295	3,844	109,788	51	32,732	7,603,710
Percent of District Catch				98.1	0.1	1.4	+	0.4	100.0

1/ Estimated fishing effort based on aerial surveys.

Table 15. Commercial salmon catch by period and species, Ugashik district, Bristol Bay, 1985.

Period	Time	Effort 1/		Number of Fish				Coho	Total
		Drift	Set	Sockeye	King	Chum	Pink		
6/ 4	24 hrs.				1				1
5	24 hrs.	1			46				46
6	24 hrs.				67				67
7	24 hrs.				119				119
8	9 hrs.				20				20
10	15 hrs.	6			280				280
11	24 hrs.	13		31	563	3			597
12	24 hrs.			31	310				341
13	24 hrs.			84	331	7			422
14	24 hrs.			161	318	3			482
15	9 hrs.	20		2	90				92
17	15 hrs.	33	4	602	258	50			910
18	24 hrs.			3,022	614	192			3,828
19	24 hrs.			8,375	486	598			9,459
20	24 hrs.			3,990	459	338			4,787
21	24 hrs.			25,297	308	939			26,544
22	9 hrs.	90		9,327	129	296			9,752
27	12 hrs.	132	36	92,222	140	1,138			93,500
29	18 hrs.	132	55	296,574	128	4,705			301,407
30	19 hrs.			372,831	129	5,560			378,520
7/ 2	15 hrs.	122	58	275,004	156	2,979			278,139
3	21 hrs.			612,591	164	4,529			617,284
5	11 hrs.			272,500	101	2,722			275,323
6	24 hrs.	274	59	550,221	183	4,933			555,337
7	24 hrs.			698,888	142	10,282			709,312
8	24 hrs.			362,179	150	4,402			366,731
9	24 hrs.			319,952	126	3,722			323,800
10	4 hrs.	220	59	221,560	52	3,015			224,627
11	12 hrs.			711,173	93	7,235			718,501
12	4 hrs.			34,987		622			35,609
13	24 hrs.	528	2/ 56	335,493	129	7,233			342,855
14	19 hrs.			153,037	97	5,457			158,591
15	4 hrs.			12,085	4	59			12,148
16	24 hrs.			192,408	42	6,244			198,694
17	24 hrs.			167,312	32	6,791			174,135
18	24 hrs.			145,980	31	4,966			150,977
19	24 hrs.			122,460	32	3,162			125,654
20	9 hrs.			18,975	8	823			19,806
22	15 hrs.			85,631	19	3,861		21	89,532
23	24 hrs.			89,446	38	4,789		54	94,327

(continued)

Table 15. (continued)

Period	Time	Effort 1/		Number of Fish					
		Drift	Set	Sockeye	King	Chum	Pink	Coho	Total
7/24	24 hrs.			66,843	17	3,787		78	70,725
25	24 hrs.			36,195	28	2,223		35	38,481
26	24 hrs.	65		12,639	12	1,064		21	13,736
27	9 hrs.			2,182	13	164			2,359
29	15 hrs.			6,743	6	961		78	7,788
30	24 hrs.			6,810	4	1,175		162	8,151
31	24 hrs.			6,025	7	1,292		294	7,618
8/ 1	24 hrs.			4,170	3	1,266		500	5,939
2	24 hrs.			2,928	7	987		524	4,446
3	9 hrs.			1,058	2	239		116	1,415
5	15 hrs.			1,712	3	550		1,183	3,448
6	24 hrs.			1,602	2	1,164		2,259	5,027
7	24 hrs.			216		106		499	821
8	24 hrs.			227		60		179	466
9	24 hrs.			220		106		335	681
10	9 hrs.			102	1	39		372	514
12	15 hrs.			379		329		2,012	2,720
13	24 hrs.			540	3	322		2,275	3,140
14	24 hrs.			262	2	239		1,636	2,139
15	24 hrs.			122	2	266		1,645	2,035
16	24 hrs.			267	1	277		2,147	2,692
17	9 hrs.			78		142		650	870
19	15 hrs.			43		38		1,785	1,866
20	24 hrs.			176		53	1	5,406	5,636
21	24 hrs.			59		55		2,656	2,770
22	24 hrs.			269		29		3,770	4,068
23	24 hrs.			32		4		2,102	2,138
24	9 hrs.			26		3		714	743
26	15 hrs.			47		15	2	5,001	5,065
27	24 hrs.			54		23		6,771	6,848
28	24 hrs.			17		7		2,381	2,405
29	24 hrs.	29	30	7		9		2,182	2,198
30	9 hrs.			6		3		957	966
9/ 2	15 hrs.			2				2,927	2,929
3	24 hrs.				1			2,165	2,166
4	24 hrs.							1,894	1,894
5	24 hrs.							1,491	1,491
6	9 hrs.							694	694
9-13	4 days							924	924
Total				6,346,489	6,509	118,652	3	60,914	6,532,567
Percent of District Catch				97.2	0.1	1.8	+	0.9	100.0

1/ Estimated fishing effort based on aerial surveys.

2/ Based on deliveries reported.

Table 16. Commercial salmon catch by period and species, Nushagak district, Bristol Bay, 1985.

Period	Time	Effort 1/		Number of Fish						Total
		Drift	Set	Sockeye	King	Chum	Pink	Coho		
5/28	24 hrs.				27					27
29	24 hrs.									0
30	24 hrs.				174	1				175
31	24 hrs.				227					227
6/ 1	9 hrs.				236					236
3	15 hrs.				871					871
4	24 hrs.			1	1,501	4				1,506
5	24 hrs.				957	1				958
6	24 hrs.				342	1				343
7	24 hrs.				1,475	25				1,500
8	9 hrs.			1	4,144	22				4,167
14	12 hrs.	255	18	162	5,744	435				6,341
20	12 hrs.	165	79	4,105	5,497	4,314				13,916
30 2/3/	12 hrs.	179	234	277,550	23,865	77,681				379,096
7/ 2 2/3/	12 hrs.	182	233	206,626	5,173	38,406				250,205
4-5 2/3/	12 hrs.			149,684	5,561	25,503	1			180,749
6-7 3/	12 hrs.	194	193	379,023	5,862	34,369				419,254
8-9 3/	12 hrs.	217	247	107,445	1,378	20,008				128,831
10 3/4/	17 hrs.		57	18,970	330	2,784				22,084
11 3/4/	24 hrs.		58	5,707	131	66				5,904
12 3/4/	24 hrs.		58	7,700	200					7,900
13 4/5/	24 hrs.		58	15,407	182	1				15,590
14 4/	24 hrs.			15,318	152	403				15,873
15 4/6/	24 hrs.	85		33,798	841	5,954	2	25		40,620
16	24 hrs.			33,762	880	12,094	3	70		46,809
17	24 hrs.			23,074	567	8,900	5	107		32,653
18	24 hrs.			14,384	247	5,283	2	75		19,991
19	24 hrs.			10,361	130	3,865	2	260		14,618
20	9 hrs.			2,868	34	510		413		3,825
22	15 hrs.			6,389	141	3,157	9	515		10,211
23	24 hrs.			3,360	65	1,594	3	385		5,407
24	24 hrs.			2,630	69	1,101	7	1,152		4,959
25	24 hrs.			2,384	110	1,265	3	2,498		6,260
26	24 hrs.			1,396	183	2,035	4	3,461		7,079
27	9 hrs.			473	21	233	4	510		1,241
29	18 hrs.			533	94	531	2	1,227		2,387
30	18 hrs.			381	212	2,202	7	9,587		12,389
Total				1,323,492	67,623	252,748	54	20,285		1,664,202
Percent of District Catch				79.5	4.1	15.2	+	1.2		100.0

1/ Estimated fishing effort based on aerial surveys.

2/ Large mesh king salmon gill net gear prohibited.

3/ Only set net gear allowed in the Igushik section.

4/ Igushik section only; Nushagak section remains closed.

5/ Drift net gear allowed effective 7:00 p.m.

6/ Nushagak section open 11:00 a.m. to 11:00 p.m., Igushik section open continuously through 9:00 a.m. July 20.

Table 17. Commercial sockeye salmon catch by period from Clarks Point, Ekuk and Igushik beaches, Nushagak district, Bristol Bay, 1985.

Period	Time	Number of Fish		
		Clarks Point Beach 6/	Ekuk Beach 7/	Igushik Beach 8/
6/14	12 hrs.		59	
20	12 hrs.	100	344	640
30 1/2/	12 hrs.	10,005	46,048	9,510
7/ 2 1/2/	12 hrs.	3,583	21,078	10,055
4- 5 1/2/	12 hrs.	2,368	13,029	9,079
6- 7 2/	12 hrs.	9,568	49,238	9,832
8- 9 2/	12 hrs.	3,356	8,050	6,484
10 2/3/	17 hrs.			8,139
11 2/3/	24 hrs.			8,356
12 2/3/	24 hrs.			13,477
13 3/4/	24 hrs.			4,634
14 3/	24 hrs.			10,326
15 3/5/	24 hrs.	399	1,351	6,217
16	24 hrs.	271	4,009	3,811
17	24 hrs.	317	2,353	1,588
18	24 hrs.	230	2,076	1,227
19	24 hrs.	489	1,931	
20	9 hrs.	62	777	
22	15 hrs.	103	716	1,075
23	24 hrs.	54	130	
24	24 hrs.	109		
Total		31,014	151,189	104,450

- 1/ Large mesh king salmon gill net gear prohibited.
- 2/ Only set net gear allowed in the Igushik section.
- 3/ Igushik section only; Nushagak section remains closed.
- 4/ Drift net gear allowed effective 7:00 p.m.
- 5/ Nushagak section open 11:00 a.m. to 11:00 p.m., Igushik section open continuously through 9:00 a.m., July 20.
- 6/ Approximate fishing effort was 24 set nets. Sockeye salmon accounted for 97.2% of the total beach catch; catch of other species included 246 kings, 658 chums, and 1 coho.
- 7/ Approximate fishing effort was 90 set nets. Sockeye salmon accounted for 96.3% of the total beach catch; catch of other species included 506 kings, 5,114 chums, 14 pinks and 100 cohos.
- 8/ Approximate fishing effort was 58 set nets. Sockeye salmon accounted for 96.8% of the total beach catch; catch of other species included 3,334 kings, 96 chums, 1 pink and 2 cohos.

Table 18. Commercial salmon catch by period and species, Togiak district, Bristol Bay, 1985.

Period 1/2/	Number of Fish				Coho	Total
	Sockeye	King	Chum	Pink		
6/10		4				4
11		116	5			121
12	8	310	59			377
13	11	168	79			258
14	12	155	63			230
15	1	50	71			122
17	41	205	64			310
18	265	1,334	482			2,081
19	372	1,253	969			2,594
20	380	1,031	750			2,161
21	660	778	617			2,055
24	1,063	754	317			2,134
25	4,101	4,895	7,260	2		16,258
26	4,125	2,627	7,877			14,629
27	7,639	2,724	8,796	1		19,160
28	6,423	1,380	6,161	8		13,972
29	1,351	140	603	3		2,097
7/ 1	8,484	1,560	4,684	2		14,730
2	16,112	3,757	13,423	9		33,301
3	18,932	2,327	16,514	7		37,780
4	17,438	1,688	15,820	13		34,959
5	11,055	1,284	8,843	10		21,192
6	983	42	463	1		1,489
8	2,831	106	7,006	1	29	9,973
9	20,219	2,837	20,829	4		43,889
10	17,348	2,615	14,888	23		34,874
11	18,211	1,868	17,191	15	1	37,286
12	813	22	2,063			2,898
13	960	14	1,400	2		2,376
15	1,231	12	1,857			3,100
16	5,948	72	4,963	13		10,996
17	4,929	38	3,089	7		8,063
18	873	4	402	1		1,280
19	1,001	15	404	1		1,421
20	2,994	25	818			3,837
22	2,033	18	1,511		2	3,564
23	2,844	50	2,460	7	4	5,365
24	2,558	41	1,381	12	1	3,993
25	742	11	388	2	1	1,144
26	1,077	16	592	4	2	1,691
27	8,547	363	16,811	48	20	25,789
28	1,621	45	1,113	3	5	2,787

(continued)

Table 19. (continued)

Period 1/2/	Number of Fish					Total
	Sockeye	King	Chum	Pink	Coho	
9	69	2	63	2	41	177
12	155	4	107	2	401	669
13	317	28	470	9	1,925	2,749
14	263	8	353	5	1,894	2,523
15	63	4	81	2	1,392	1,542
16	51	6	116		1,392	1,565
19	46	11	83	4	4,017	4,161
20	54	4	99	2	4,187	4,346
23-24	52	18	45	4	6,466	6,585
28-29	19	11	20	2	10,256	10,308
9/ 4- 5	15	5	4	2	3,704	3,730
Total	131,391	33,175	151,710	202	37,593	354,071
Percent of Section Catch	37.1	9.4	42.8	+	10.6	100.0

1/ Togiak River section open 4 days per week.

2/ See emergency order table in 1985 Bristol Bay Annual Management Report for adjustments in the regular weekly fishing schedule.

Table 20. Commercial salmon catch by period and species, Kulukak section, Togiak district, Bristol Bay, 1985.

Period 1/2/	Number of Fish				Coho	Total
	Sockeye	King	Chum	Pink		
6/13		15	9			24
15	1	16	8			25
17	32	90	25			147
18	49	120	95			264
19	57	40	60			157
20	4	11				15
21	26	17	96			139
26	1,341	454	1,465			3,260
27	3,251	478	2,057	1		5,787
28	3,069	357	1,486	7		4,919
29	1,351	140	603	3		2,097
7/ 1	2,231	155	983			3,369
2	4,034	344	2,183	3		6,564
3	5,912	330	2,216	4		8,462
4	6,114	285	2,335	11		8,745
5	5,768	221	1,815	7		7,811
6	890	37	177	1		1,105
10	4,734	287	2,975	11		8,007
11	5,601	149	2,181	8		7,939
27	196	10	342	5	4	557
28	204	5	138	2	3	352
29	172	10	67	5	5	259
8/ 1	89	1	23	8	16	137
2	17		16	1	3	37
14		2	6	1	129	138
16					93	93
17	6	1	6		321	334
20			1		97	98
Total	45,149	3,575	21,368	78	671	70,841
Percent of Section Catch	63.7	5.1	30.2	0.1	0.9	100.0

1/ Kulukak section open 5 days per week.

2/ See emergency order table in 1985 Bristol Bay Annual Management Report for adjustments in the regular weekly fishing schedule.

Table 21. Commercial salmon catch by period and species, Matogak section, Togiak district, Bristol Bay, 1985.

Period 1/2/	Number of Fish					Total
	Sockeye	King	Chum	Pink	Coho	
6/15		15				15
7/ 5	133	10	515			658
6	93	5	286			384
8	2,534	84	6,316	1	29	8,964
9	1,155	33	1,973			3,161
11	238	6	452	1		697
12	795	22	1,968			2,785
13	960	14	1,400	2		2,376
15	1,231	12	1,857			3,100
16	3,357	38	2,584	7		5,986
17	4,549	35	2,707	3		7,294
18	541	3	210			754
19	1,001	15	404	1		1,421
20	2,994	25	818			3,837
22	2,033	18	1,511		2	3,564
23	2,002	26	1,650	5	4	3,687
24	2,422	38	1,289	9	1	3,759
25	493	7	194			694
26	353	4	215	1	1	574
8/ 2	21	1	44		1	67
3	32		21	1	4	58
Total	26,937	411	26,414	31	42	53,835
Percent of Section Catch	50.0	0.8	49.1	+	+	100.0

1/ Matogak section open 5 days per week.

2/ See emergency order table in 1985 Bristol Bay Annual Management Report for adjustments in the regular weekly fishing schedule.

Table 22. Commercial salmon catch by period and species, Osviak section, Togiak district, Bristol Bay, 1985.

Period 1/2/	Number of Fish				Coho	Total
	Sockeye	King	Chum	Pink		
6/15		19	63			82
20		33	23			56
25	37	18	692			747
7/ 8	297	22	690			1,009
9	2		10			12
16	2,591	34	2,379	6		5,010
17	380	3	382	4		769
18	332	1	192	1		526
23	842	24	810	2		1,678
24	136	3	92	3		234
25	249	4	194	2	1	450
26	724	12	377	3	1	1,117
27	1,310	20	933	8	2	2,273
30	92	1	37		1	131
8/14	1		4	1	26	32
20					203	203
23-24					162	162
28-29					105	105
Total	6,993	194	6,878	30	501	14,596
Percent of Section Catch	47.9	1.3	47.1	0.2	3.4	100.0

1/ Osviak section open 5 days per week.

2/ See emergency order table in 1985 Bristol Bay Annual Management Report for adjustments in the regular weekly fishing schedule.

Table 23. Commercial salmon catch by period and species, Cape Peirce section, Togiak district, Bristol Bay, 1985.

Period 1/2/	Number of Fish				Coho	Total
	Sockeye	King	Chum	Pink		
8/23-24					369	369
Total					369	369

1/ Cape Peirce section open 5 days per week.

2/ See emergency order table in 1985 Bristol Bay Annual Management Report for adjustments in the regular weekly fishing schedule.

Table 18. (continued)

Period 1/2/	Number of Fish					
	Sockeye	King	Chum	Pink	Coho	Total
7/29	3,895	126	3,198	16	29	7,264
30	2,995	153	2,748	13	41	5,950
31	2,340	83	1,555	18	84	4,080
8/ 1	1,409	46	710	26	104	2,295
2	844	25	445	5	73	1,392
3	32		21	1	4	58
5	753	14	1,410	10	459	2,646
6	645	22	1,220	13	704	2,604
7	99	7	222	3	139	470
8	111	21	297	1	294	724
9	69	2	63	2	41	177
12	155	4	107	2	401	669
13	317	28	470	9	1,925	2,749
14	264	10	363	7	2,049	2,693
15	63	4	81	2	1,392	1,542
16	51	6	116		1,485	1,658
17	6	1	6		321	334
19	46	11	83	4	4,017	4,161
20	54	4	100	2	4,487	4,647
23-24	52	18	45	4	6,997	7,116
28-29	19	11	20	2	10,361	10,413
9/ 4- 5	15	5	4	2	3,704	3,730
Total	210,470	37,355	206,370	341	39,176	493,712
Percent of District Catch	42.7	7.6	41.8	0.1	7.8	100.0

1/ Togiak River section open 4 days per week, while other sections open 5 days per week.

2/ See emergency order table in 1985 Bristol Bay Annual Management Report for adjustments in the regular weekly fishing schedule.

Table 19. Commercial salmon catch by period and species, Togiak section, Togiak district, Bristol Bay, 1985.

Period 1/2/	Number of Fish				Coho	Total
	Sockeye	King	Chum	Pink		
6/10		4				4
11		116	5			121
12	8	310	59			377
13	11	153	70			234
14	12	155	63			230
17	9	115	39			163
18	216	1,214	387			1,817
19	315	1,213	909			2,437
20	376	987	727			2,090
21	634	761	521			1,916
24	1,063	754	317			2,134
25	4,064	4,877	6,568	2		15,511
26	2,784	2,173	6,412			11,369
27	4,388	2,246	6,739			13,373
28	3,354	1,023	4,675	1		9,053
7/ 1	6,253	1,405	3,701	2		11,361
2	12,078	3,413	11,240	6		26,737
3	13,020	1,997	14,298	3		29,318
4	11,324	1,403	13,485	2		26,214
5	5,154	1,053	6,513	3		12,723
9	19,062	2,804	18,846	4		40,716
10	12,614	2,328	11,913	12		26,867
11	12,372	1,713	14,558	6	1	28,650
12	18		95			113
27	7,041	333	15,536	35	14	22,959
28	1,417	40	975	1	2	2,435
29	3,723	116	3,131	11	24	7,005
30	2,903	152	2,711	13	40	5,819
31	2,340	83	1,555	18	84	4,080
8/ 1	1,320	45	687	18	88	2,158
2	806	24	385	4	69	1,288
5	753	14	1,410	10	459	2,646
6	645	22	1,220	13	704	2,604
7	99	7	222	3	139	470
8	111	21	297	1	294	724

(continued)

Table 24. Total commercial salmon catch by day and district, Bristol Bay, 1985. 1/

Date	Time	Number of Fish in Thousands					Total
		Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	
> 6/ 9		+	+	+	10		10
10-19	10 days	2	106	16	6	6	136
20	24 hrs.		19	5	14	2	40
21	24 hrs.		271	27		2	300
22	24 hrs.	139	82	10			231
23	24 hrs.						
24	24 hrs.					2	2
25	24 hrs.					16	16
26	24 hrs.					15	15
27	24 hrs.		882	94		19	995
28	24 hrs.	1,184				14	1,198
29	24 hrs.	372	1,154	301		2	1,829
30	24 hrs.	1,379	813	379	379		2,950
7/ 1	24 hrs.	433				15	448
2	24 hrs.	820	597	278	250	33	1,978
3	24 hrs.	40		617		38	695
4	24 hrs.	751			181	35	967
5	24 hrs.	455	548	275		21	1,299
6	24 hrs.		391	555	419	1	1,366
7	24 hrs.		712	709			1,421
8	24 hrs.	246	383	367	129	10	1,135
9	24 hrs.	504	60	324		44	932
10	24 hrs.	390	463	225	22	35	1,135
11	24 hrs.	484	44	719	6	37	1,290
12	24 hrs.	744	399	36	8	3	1,190
13	24 hrs.		169	343	16	2	530
14	24 hrs.		116	159	16		291
15	24 hrs.		67	12	41	3	123
16	24 hrs.		66	199	47	11	323
17	24 hrs.	71	44	174	33	8	330
18	24 hrs.		54	151	20	1	226
19	24 hrs.		55	126	15	1	197
20	24 hrs.		15	20	4	4	43
21-27	7 days	275	54	309	35	42	715
28-8/3	7 days	32	10	35	15	24	116
4-10	7 days	9	6	11		7	33
11-17	7 days	1	11	14		10	36
18-24	7 days		6	17		16	39
25-31	7 days		6	17		10	33
9/ 1- 7	7 days		+	9		4	13
8-14	7 days		+	1			1
Total		8,325	7,604	6,533	1,664	494	24,619

1/ Due to rounding the daily catches may not equal the sum of the district totals.

Table 25. Commercial salmon catch by district and species, Bristol Bay, 1985. 1/

District and River System	Number of Fish				Coho	Total
	Sockeye	King	Chum	Pink		
NAKNEK-KVICHAK DISTRICT						
Kvichak River	6,160,498					
Branch River	143,859					
Naknek River	1,831,453					
Total	8,135,810	5,891	175,598	27	7,706	8,325,032
EGEGIK DISTRICT						
	7,457,295	3,844	109,788	51	32,732	7,603,710
UGASHIK DISTRICT						
	6,346,489	6,509	118,652	3	60,914	6,532,567
NUSHAGAK DISTRICT						
Wood River	791,289					
Igushik River	179,068					
Nuyakuk River	277,104					
Nushagak-Mulchatna	59,032					
Snake River	16,999					
Total	1,323,492	67,623	252,748	54	20,285	1,664,202
TOGLIAK DISTRICT						
Togiak Section	131,391	33,175	151,710	202	37,593	354,071
Kulukak Section	45,149	3,575	21,368	78	671	70,841
Matogak Section	26,937	411	26,414	31	42	53,835
Osviak Section	6,993	194	6,878	30	501	14,596
Cape Peirce Section					369	369
Total	210,470	37,355	206,370	341	39,176	493,712
TOTAL BRISTOL BAY	23,473,556	121,222	863,156	476	160,813	24,619,223
SPECIES PERCENT	95.4	0.4	3.5	+	0.7	100.0

1/ Apportionment of the inshore sockeye salmon catch by river system to the Naknek-Kvichak and Nushagak districts is preliminary.

Table 26. Daily sockeye salmon escapement tower counts by river system, Bristol Bay, 1985.

Date	Kvichak River		Naknek River		Egegik River		Ugashik River	
	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.
6/21	0	0	0	0	0	0	78	78
22	0	0	0	0	2,388	2,388	96	174
23	30	30	264	264	2,532	4,920	78	252
24	6	36	390	654	678	5,598	132	384
25	54	90	78	732	726	6,324	42	426
26	24	114	6	738	1,524	7,848	60	486
27	78	192	189,054	189,792	8,562	16,410	42	528
28	113,040	113,232	226,116	415,908	43,848	60,258	12	540
29	248,586	361,818	60,624	476,532	52,008	112,266	17,580	18,120
30	268,590	630,408	68,364	544,896	75,240	187,506	107,766	125,886
7/ 1	348,390	978,798	54,180	599,076	68,814	256,320	26,382	152,268
2	237,174	1,215,972	65,484	664,560	21,222	277,542	24,060	176,328
3	120,714	1,336,686	43,230	707,790	109,080	386,622	564	176,892
4	263,520	1,600,206	11,196	718,986	132,306	518,928	546	177,438
5	305,760	1,905,966	64,122	783,108	96,036	614,964	90	177,528
6	422,682	2,328,648	48,180	831,288	154,536	769,500	156,342	333,870
7	408,498	2,737,146	192,564	1,023,852	48,036	817,536	249,198	583,068
8	398,586	3,135,732	351,798	1,375,650	31,260	848,796	145,356	728,424
9	696,174	3,831,906	153,492	1,529,142	22,800	871,596	27,666	756,090
10	792,150	4,624,056	12,084	1,541,226	45,684	917,280	11,388	767,478
11	702,282	5,326,338	9,192	1,550,418	39,234	956,514	16,890	784,368
12	473,142	5,799,480	32,442	1,582,860	63,138	1,019,652	4,584	788,952
13	297,138	6,096,618	26,190	1,609,050	32,598	1,052,250	14,970	803,922
14	298,524	6,395,142	57,330	1,666,380	29,328	1,081,578	5,580	809,502
15	220,332	6,615,474	38,076	1,704,456	5,874	1,087,452	7,854	817,356
16	110,898	6,726,372	22,194	1,726,650	2,442	1,089,894	14,328	831,684
17	41,940	6,768,312	13,974	1,740,624	1,200	1,091,094	20,382	852,066
18	19,020	6,787,332	14,670	1,755,294	1,404	1,092,498	13,272	865,338
19	7,296	6,794,628	18,048	1,773,342	1,836	1,094,334	40,356	905,694
20	2,496	6,797,124	20,286	1,793,628	858	1,095,192	37,422	943,116
21	2,118	6,799,242	43,224	1,836,852			16,086	959,202
22	64,830	6,864,072	7,008	1,843,860			9,984	969,186
23	256,434	7,120,506	4,746	1,848,606			11,952	981,138
24	66,270	7,186,776	1,332	1,849,938			8,574	989,762
25	10,608	7,197,384					4,818	994,530
26	6,888	7,204,272					2,496	997,026
27	2,742	7,207,014					1,206	998,232
28	3,090	7,210,104						
29	942	7,211,046						
30								
31								
8/ 1								
2								
3								
Total		7,211,046		1,849,938		1,095,192		998,232

(continued)

Table 26. (continued)

Date	Wood River		Igushik River		Nuyakuk River		Togiak River	
	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.
6/17	0	0						
18	0	0						
19	0	0						
20	0	0	0	0				
21	0	0	0	0				
22	0	0	0	0				
23	0	0	0	0				
24	0	0	0	0				
25	0	0	0	0			0	0
26	0	0	36	36			0	0
27	0	0	30	66			0	0
28	0	0	42	108	0	0	0	0
29	0	0	1,002	1,110	0	0	0	0
30	2,754	2,754	3,912	5,022	0	0	0	0
7/ 1	78,294	81,048	2,262	7,284	0	0	0	0
2	85,764	166,812	3,594	10,878	0	0	0	0
3	86,634	253,446	14,034	24,912	0	0	0	0
4	98,082	351,528	16,092	41,004	0	0	0	0
5	29,448	380,976	14,454	55,458	5,322	5,322	6	6
6	19,584	400,560	12,336	67,794	35,040	40,362	42	48
7	20,922	421,482	10,614	78,408	51,264	91,626	18	66
8	67,242	488,724	24,120	102,528	47,310	138,936	54	120
9	84,354	573,078	25,488	128,016	32,262	171,198	144	264
10	48,594	621,672	26,142	154,158	26,604	197,802	438	702
11	24,276	645,948	17,964	172,122	14,004	211,806	3,954	4,656
12	30,774	676,722	9,390	181,512	33,354	245,160	5,178	9,834
13	20,472	697,194	8,880	190,392	33,156	278,316	5,646	15,480
14	88,914	786,108	3,312	193,704	16,446	294,762	6,198	21,678
15	92,334	878,442	5,682	199,386	8,766	303,528	4,392	26,070
16	34,920	913,362	3,018	202,404	7,992	311,520	3,384	29,454
17	11,706	925,068	3,474	205,878	5,322	316,842	4,254	33,708
18	4,284	929,352	2,946	208,824	11,598	328,440	5,988	39,696
19	3,846	933,198	1,872	210,696	26,910	355,350	4,524	44,220
20	2,322	935,520	1,266	211,962	22,302	377,652	8,016	52,236
21	2,040	937,560	372	212,334	23,178	400,830	6,042	58,278
22	1,074	938,634	120	212,454	8,100	408,930	7,578	65,856
23	366	939,000			3,738	412,668	5,820	71,676
24					4,608	417,276	8,232	79,908
25					4,560	421,836	8,406	88,314
26					2,562	424,398	10,710	99,024
27					1,866	426,264	6,288	105,312
28					1,482	427,746	6,942	112,254
29					936	428,682	6,414	118,668
30					480	429,162	4,614	123,282
31							3,798	127,080
8/ 1							3,660	130,740
2							2,466	133,206
3							1,356	134,562
4							822	135,384
5							450	135,834
6							612	136,446
7							96	136,542
Total		939,000		212,454		429,162		136,542

Table 27. Daily salmon escapement sonar counts by species, Nushagak River, Bristol Bay, 1985.

Date	Sockeye		King		Chum		Coho		Total	
	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.
6/11	19	19	44	46	3	3	0	0	67	67
12	5	24	9	55	0	3	0	0	14	81
13	42	66	112	168	9	12	0	0	163	244
14	48	113	148	316	17	28	0	0	212	456
15	7	121	33	348	6	34	0	0	46	502
16	6	127	24	373	4	38	0	0	34	536
17	4	131	14	387	2	39	0	0	20	556
18	8	139	20	406	1	41	0	0	29	585
19	82	221	371	778	66	107	0	0	519	1,104
20	3,124	3,345	2,671	3,449	6,283	6,389	0	0	12,078	13,182
21	2,616	5,961	3,886	7,334	3,209	9,598	0	0	9,711	22,893
22	915	6,876	1,755	9,090	1,414	11,012	0	0	4,084	26,977
23	1,698	8,574	3,557	12,647	2,846	13,858	0	0	8,101	35,078
24	369	8,943	888	13,535	703	14,562	0	0	1,961	37,039
25	229	9,172	380	13,915	310	14,872	0	0	918	37,957
26	419	9,590	645	14,560	531	15,403	0	0	1,595	39,552
27	421	10,011	1,761	16,321	1,354	16,756	0	0	3,536	43,088
28	305	10,317	1,716	18,037	1,306	18,062	0	0	3,327	46,415
29	908	11,224	604	18,641	347	18,409	0	0	1,858	48,273
30	1,400	12,624	907	19,548	541	18,950	0	0	2,848	51,121
7/ 1	53,282	65,907	9,184	28,731	18,749	37,699	0	0	81,215	132,336
2	35,792	101,699	15,016	43,747	27,024	64,723	0	0	77,832	210,168
3	18,234	119,933	6,527	50,274	9,186	73,909	0	0	33,947	244,115
4	13,382	133,315	4,291	54,565	6,889	80,799	0	0	24,563	268,678
5	13,210	146,525	4,074	58,639	6,848	87,647	0	0	24,132	292,810
6	16,440	162,965	5,850	64,489	8,293	95,940	0	0	30,583	323,393
7	12,124	175,089	4,023	68,512	6,201	102,141	0	0	22,348	345,741
8	21,881	196,970	3,217	71,728	7,338	109,480	0	0	32,436	378,177
9	19,258	216,228	2,752	74,480	6,601	116,081	0	0	28,611	406,788
10	10,439	226,666	2,886	77,366	5,348	121,428	0	0	18,672	425,460
11	6,703	233,369	2,192	79,558	4,401	125,829	0	0	13,295	438,755
12	8,538	241,907	1,222	80,780	1,178	127,007	0	0	10,938	449,693
13	5,459	247,366	829	81,609	746	127,753	0	0	7,034	456,727
14	11,785	259,151	1,880	83,489	1,596	129,349	0	0	15,261	471,988
15	22,640	281,791	4,016	87,505	18,524	147,873	0	0	45,179	517,167
16	12,476	294,267	2,000	89,505	10,549	158,421	0	0	25,025	542,192
17	8,491	302,758	1,718	91,223	4,898	163,320	0	0	15,108	557,300
18	7,469	310,227	1,631	92,854	4,215	167,535	0	0	13,315	570,615
19	2,708	312,935	2,389	95,244	20,261	187,796	127	127	25,486	596,101
20	928	313,863	951	96,195	5,744	193,540	73	200	7,696	603,797

(continued)

Table 27. (continued)

Date	Sockeye		Ring		Chum		Coho		Total	
	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.	Daily	Accum.
7/21	1,616	315,480	493	96,688	5,687	199,227	131	331	7,927	611,724
22	1,484	316,964	477	97,165	5,002	204,229	106	437	7,069	618,793
23	1,226	318,189	371	97,535	4,338	208,566	101	538	6,035	624,828
24	395	318,584	119	97,654	1,403	209,970	33	571	1,950	626,778
25	1,402	319,986	522	98,177	358	210,327	575	1,146	2,857	629,635
26	898	320,884	319	98,495	219	210,546	367	1,513	1,802	631,437
27	658	321,542	234	98,730	160	210,706	269	1,782	1,321	632,758
28	258	321,799	104	98,833	71	210,777	106	1,888	539	633,297
29	42	321,842	29	98,863	20	210,797	19	1,907	110	633,407
30	36	321,877	17	98,879	11	210,809	15	1,922	79	633,486
31	47	321,924	27	98,906	18	210,827	20	1,942	112	633,598
8/ 1	37	321,961	26	98,933	18	210,845	17	1,958	98	633,696
2	36	321,998	18	98,951	12	210,857	15	1,974	82	633,778
3	42	322,039	24	98,975	16	210,873	18	1,992	100	633,878
4	142	322,181	62	99,037	43	210,916	59	2,051	306	634,184
5	0	322,181	0	99,037	122	211,038	4,124	6,175	4,246	638,430
6	0	322,181	0	99,037	174	211,212	5,979	12,154	6,153	644,583
7	0	322,181	0	99,037	110	211,322	3,900	16,054	4,010	648,593
8	0	322,181	0	99,037	472	211,794	22,181	38,235	22,653	671,246
9	18	322,199	0	99,037	445	212,238	7,880	46,115	8,343	679,589
10	11	322,211	0	99,037	172	212,410	2,908	49,023	3,091	682,680
11	6	322,217	0	99,037	206	212,616	3,731	52,754	3,943	686,623
12	26	322,243	0	99,037	487	213,103	8,459	61,213	8,972	695,595
13	21	322,263	0	99,037	260	213,363	4,289	65,502	4,570	700,165
14	37	322,301	0	99,037	511	213,874	8,554	74,057	9,103	709,268
15	10	322,311	0	99,037	231	214,106	4,098	78,155	4,339	713,607
16	5	322,315	0	99,037	145	214,250	2,605	80,759	2,754	716,361
17	2	322,317	0	99,037	71	214,321	1,286	82,046	1,359	717,720
18	2	322,319	0	99,037	54	214,375	960	83,006	1,016	718,736
19	2	322,321	0	99,037	54	214,429	963	83,969	1,020	719,756
20	3	322,324	0	99,037	41	214,470	698	84,667	741	720,497
21	1	322,325	0	99,037	9	214,480	156	84,823	166	720,663
Total		322,325		99,037		214,480		84,823		720,663

Table 28. Salmon aerial survey escapement estimates by species, district and river system, Bristol Bay, 1985. 1/

District and River System	Number of Fish 2/							
	Sockeye		King		Chum		Coho	
	Index	Total	Index	Total	Index	Total	Index	Total
NAKNAK-KVICHAK DISTRICT								
Kvichak River								
Branch River		118,030	9,518		31,200			
Naknek River 3/			4,270		3,000			
Total		118,030	13,788		34,200			
EGEGIK DISTRICT								
Egegik River 4/	100		155		400		5,260	
King Salmon River 5/			925		4,785			
Total	100		1,080		5,185		5,260	
UGASHIK DISTRICT								
Dog Salmon River	775		560		350			
Mother Goose 6/	7,400		6,351		28,900		18,500	
Upper Ugashik R.			50		0		2,380	
Total	8,175		6,961		29,250		20,880	
NUSHAGAK DISTRICT								
Wood River 7/			20	60				
Muklung River	2,400	6,000	1,250	3,750				
Igushik River			200	600				
Nuyakuk River 8/								
Nushagak River 9/	20,000	50,000	14,900	44,700				
Mulchatna River 10/	5,300	13,300	7,630	22,890				
Snake River	17,440	34,880	10	30				
Total	45,140	104,180	24,010	72,030				
TOGLIAK DISTRICT								
Togiak River 11/	4,400	8,800	4,790	12,010	60,200	127,800	11,070	33,210
Ungalikthluk River 12/	1,570	3,140	170	550	14,780	29,690		
Kulukak River 13/	18,300	36,600	540	1,350	7,800	15,600	7,790	23,370
Quigmy River			0	0	1,800	3,600	200	600
Matogak River	0	0	100	250	2,860	7,150	610	2,440
Osviak River	200	400	50	130	5,460	10,920	420	1,680
Slug River	2,300	4,600			8,800	17,600		
Total	26,770	53,540	5,650	14,290	101,700	212,360	20,090	61,300
TOTAL BAY	80,185	275,750	51,489	86,320	170,335	212,360	46,230	61,300

- 1/ Detailed information on aerial survey derived escapements are published in annual summary reports.
- 2/ Aerial survey escapement estimates are categorized as: index - indices of total escapement; generally data is incomplete which will not allow determination of total escapement; total - aerial survey data is complete and does allow estimate of total escapement.
- 3/ Includes Paul's King Salmon and Big Creeks.
- 4/ Includes Shosky Creek.
- 5/ Includes Contact, Takayoto, Gertrude Creeks and several smaller tributaries.
- 6/ Includes Pumice, Old and Painter Creeks and Mother Goose system.
- 7/ Includes Youth and Sunshine Creeks, and Agulowak River.
- 8/ Below the counting tower.
- 9/ Includes Iowithla, Kokwok, Klutispaw, King Salmon and Chichitnok Rivers, and Klutuk Creek.
- 10/ Includes Stuyahok, Kottuli, Chilchitna, Chilikadrotna Rivers, and Mosquito Creek.
- 11/ Includes Gechiak and Pungokepuk Creeks and Kashaia, Narogurum and Onglvinuck Rivers.
- 12/ Includes Kukayachagak River.
- 13/ Includes Kulukak Lake and Tithe Creek ponds.

Table 29. Daily sockeye salmon tower counts, aerial survey and river test fishing escapement estimates, Kvichak River, Bristol Bay, 1985.

Escapement Enumeration Method in Thousands of Fish											
Date	Aerial Survey						River Test Fishing				
	Tower Count		Nakeen to Index	Index to Index	Index to Tower	Total	Fish Per Index Pt.1/	Index Daily	Points		Accumulative Escapement
	Daily	Accum.							Accum.		
6/22							338	5	5		2
23	+	+					338	0	5		2
24	+	+					338	0	5		2
25	+	+					338	0	5		2
26	+	+					338	5	9		3
27	+	+	77	80	+	158	38	3,900	3,909		152
28	113	113	95	287	102	484 2/	38	5,544	9,453		361
29	249	362	451	516	198	1,165	93	5,471	14,924		1,381
30	269	630	394	502	215	1,110	116	5,052	19,976		2,317
7/ 1	348	979					90	1,023	20,999		1,890
2	237	1,216	29	51	64	144 2/	61	1,612	22,611		1,376
3	121	1,337					64	2,941	25,552		1,627
4	264	1,600	70	68	95	234	71	1,029	26,581		1,881
5	306	1,906	27	52	69	149	75	1,051	27,632		2,072
6	423	2,329	18	86	61	166	91	977	28,609		2,603
7	408	2,737	61	23	91	175 2/	107	1,588	30,197		3,235
8	399	3,136	73	288	95	456 2/	118	3,928	34,125		4,027
9	696	3,832	293	957	295	1,545	142	2,275	36,400		5,169
10	792	4,624	45	513	335	893	167	258	36,658		6,122
11	702	5,326	15	242	366	623	167	182	36,841		6,152
12	473	5,799	151	51	117	319	170	1,788	38,628		6,567
13	297	6,097	61	155	108	323	173	440	39,068		6,759
14	299	6,395	94	58	83	234	176	1,272	40,340		7,100
15	220	6,615	68	16	9	93	171	1,063	41,403		7,080
16	111	6,726					169	246	41,649		7,039
17	42	6,768									
18	19	6,787									
19	7	6,795									
20	2	6,797									
Total		7,211							41,649		7,039

1/ Fish per index point was originally based on the historic relationship between escapements and test fishing indices, and was adjusted inseason based on lag time and catchability factors.

2/ Poor survey conditions.

Table 30. Daily sockeye salmon tower counts, aerial survey and river test fishing escapement estimates, Egegik River, Bristol Bay, 1985.

Escapement Enumeration Method in Thousands of Fish								
Date	Tower Count		Aerial Survey		Fish Per Index Pt.1/	River Test Fishing Index Points		Accumulative Escapement
	Daily	Accum.	Lagoon	Total		Daily	Accum.	
6/21					173	13	13	2
22	2	2			173	33	46	8
23	3	5	6	6	115	292	338	39
24	1	6			86	83	421	36
25	1	7			92	60	481	44
26	1	8			86	565	1,046	90
27	9	17	33	33	83	2,552	3,598	299
28	44	61			61	2,156	5,754	351
29	52	113	128	478	60	5,400	11,154	669
30	75	188			58	1,022	12,176	706
7/ 1	69	257	149	149	60	961	13,137	788
2	21	278			58	1,198	14,335	831
3	109	387	140	240	58	543	14,878	863
4	132	519	119	270	57	1,052	15,930	908
5	96	615			57	1,692	17,622	1,004
6	155	770	94	94	57	616	18,238	1,040
7	48	818			57	136	18,374	1,047
8	31	849	40	40	57	348	18,722	1,067
9	23	872	13	13	58	1,251	19,973	1,158
10	46	918	32	32				
11	39	957	33	33				
12	63	1,020						
13	33	1,053						
14	29	1,082						
15	6	1,088						
16	2	1,090						
17	1	1,091						
18	1	1,092						
19	2	1,094						
20	1	1,095						
Total		1,095					19,973	1,158

1/ Fish per index point was originally based on the historic relationship between escapements and test fishing indices, and was adjusted inseason based on lag time and catchability factors.

Table 31. Daily sockeye salmon tower counts, aerial survey and river test fishing escapement estimates, Ugashik River, Bristol Bay, 1985.

Escapement Enumeration Method in Thousands of Fish								
Date	Tower Count		Aerial Survey		Fish Per Index Pt.1/	River Test Fishing Index Points		Accumulative Escapement
	Daily	Accum.	Lagoon	Total		Daily	Accum.	
6/22					34	29	29	1
23			0	0	25	9	38	.1
24					23	10	48	1
25					23	32	80	2
26					24	16	96	2
27					25	60	156	4
28	+	+			41	217	373	15
29	+	+			41	273	646	26
30	+	+			41	925	1,571	64
7/ 1	+	+			41	2,459	4,030	165
2	+	+			41	729	4,759	195
3	+	+			41	3,084	7,843	322
4	+	1	2	43	41	4,861	12,704	521
5	+	1			41	2,414	15,118	620
6	18	19	19	19	41	3,605	18,723	768
7	108	127			41	3,555	22,278	913
8	26	153	64	65	41	2,657	24,935	1,022
9	24	177	68	80	41	1,165	26,100	1,070
10	1	178	33	40	41	511	26,611	1,091
11	1	179	57	57	41	155	26,766	1,097
12	+	179	245	290	41	1,220	27,986	1,147
13	156	335			41	2,417	30,403	1,247
14	249	584	50	50	41	312	30,715	1,259
15	145	729			41	70	30,785	1,262
16	28	757			41	53	30,838	1,264
17	11	768						
18	17	785						
19	5	790						
20	15	805						
Total		998					30,838	1,264

1/ Fish per index point was originally based on the historic relationship between escapements and test fishing indices, and was adjusted inseason based on lag time and catchability factors.

Table 32. Daily sockeye salmon tower counts and aerial survey escapement estimates, Wood River, Bristol Bay, 1985.

Escapement Enumeration Method in Thousands of Fish				
Date	Tower Count		Aerial Survey 1/	
	Daily	Accum.	Number	Comments
6/18	0	0		
19	0	0	0	Poor visibility.
20	0	0		
21	0	0	0	Good visibility.
22	0	0		
23	0	0		
24	0	0	+	Good vis.; no sign lower river.
25	0	0	+	Good vis.; no sign lower river.
26	0	0	+	Good vis.; no sign lower river.
27	0	0	0	Good vis.; no sign lower river.
28	0	0	0	Fair vis.; no sign lower river.
29	0	0	+	Fair vis.; no sign lower river.
30	3	3	1	Poor vis.; finners above Red Bluff.
7/ 1	78	81	68	9:45 a.m. 48,000; 11:30 a.m. 68,000; poor vis.; finners below.
2	86	167	38	Fair vis.; heavy fish lower river.
3	87	253	46	Good vis.; est. total river at 100,000.
4	98	352	74	Poor vis.; est. total river at 150,000.
5	29	381	18	Good vis.; no sign lower river.
6	20	401	11	Poor vis.; no sign lower river.
7	21	421	21	1:05 p.m., 10,000; 6:05 p.m., 21,000, fair vis.
8	67	489	26	Good/exc. vis., some finners lower river, not heavy.
9	84	573	20	Exc. vis.; no sign lower river.
10	49	622	35	Exc. vis.; no sign lower river.
11	24	646	7	Good vis.; no sign lower river.
12	31	677	4	Fair vis.; no sign lower river.
13	20	697	1	Very poor visibility.
14	89	786		
15	92	878	37	8:20 a.m., 37,000; 4:10 p.m., 17,000; poor vis.
16	35	913	17	Good visibility.
17	12	925		
18	4	929		
Total		939		

1/ Includes estimates of fish in clear water index areas immediately below the counting tower at the time of the survey.

Table 33. Inseason comparison of ocean age composition of sockeye salmon escapement using length frequency and scale analysis methods, Wood River, Bristol Bay, 1985.

Date	Percent by Ocean Age				Sample Size
	2-Ocean		3-Ocean		
	Length Frequency	Scales	Length Frequency	Scales	
Forecast:					
Composite -		61%		39%	
Standard -		40%		60%	
Actual: 1/					
7/ 1	46%	44%	54%	56%	185
2	52%	50%	48%	50%	192
3	57%	48%	43%	52%	172
7/1- 3	51%	47%	49%	53%	549
4	53%	47%	47%	53%	170
5	65%	50%	35%	50%	79
7/1- 5	53%	48%	47%	52%	798
8	81%	76%	19%	24%	116
9	63%	55%	27%	45%	199
10	60%	34%	40%	66%	138
11	65%	54%	35%	44%	136
7/1-11	59%	50%	41%	50%	1,387
12	58%	52%	42%	48%	120
14	51%	36%	49%	64%	200
15	50%	38%	50%	62%	178
16	72%	-	22%	-	69
7/1-16	58%	48%	42%	52%	1,954
Final:	58%	49%	42%	51%	1,679 2/

1/ Age composition(s) as collected and analyzed on a daily basis inseason.

2/ Actual number of readable scales.

Table 34. Daily sockeye salmon tower counts, aerial survey and river test fishing escapement estimates, Igushik River, Bristol Bay, 1985.

Escapement Enumeration Method in Thousands of Fish									
Date	Tower Count		Aerial Survey 1/			Fish Per Index Pt.2/	River Test Fishing		Accumulative Escapement
	Daily	Accum.	Lagoon	River	Total		Daily	Accum.	
6/17						26	0	25	1
18						26	0	25	1
19			0	0	0	26	29	54	1
20	0	0				26	52	106	3
21	0	0	0	0	0	26	2	108	3
22	0	0				26	12	120	3
23	0	0				26	11	131	3
24	0	0	+	0	+	26	39	170	4
25	0	0	+	0	+	15	81	251	4
26	+	+	1	+	1	15	265	516	8
27	+	+	1	0	1	15	172	688	10
28	+	+	1	0	1	15	555	1,243	19
29	1	1	4	+	4	15	506	1,749	26
30	4	5	3	1	4	15	560	2,309	35
7/ 1	2	7	2	+	2	15	724	3,033	45
2	4	11	3	1	4	11	1,254	4,287	47
3	14	25	3	1	4	11	1,256	5,543	61
4	16	41	1	1	2	15	1,228	6,771	102
5	14	55	3	3	6	15	800	7,571	114
6	12	68	1	1	1	15	1,001	8,572	129
7	11	78				15	1,973	10,545	158
8	24	103				15	1,712	12,257	184
9	25	128	2	2	4	15	1,753	14,010	210
10	26	154	2	2	4	15	804	14,850	223
11	18	172	1	1	2	15	593	15,443	232
12	9	182	+	1	1				
13	9	190	+	1	1				
14	3	194							
15	6	199							
Total		212						15,443	232

1/ Includes estimates of fish in clear water index areas immediately below the counting tower at the time of the survey.

2/ Fish per index point was originally based on the historic relationship (average of 25.9 fish per index point from 1976-84) between escapements and test fishing indices, and was adjusted periodically during the season based on catchability and lag timing factors.

Table 35. Daily sockeye salmon sonar and tower counts and aerial survey escapement estimates, Nushagak/Nuyakuk Rivers, Bristol Bay, 1985.

Escapement Enumeration Method in Thousands of Fish						
Date	Nushagak River Sockeye Salmon Sonar Count		Nuyakuk River Sockeye Salmon Tower Count		Aerial Survey Black Pt. to Portage Cr. 1/	
	Daily	Accum.	Daily	Accum.	Number	Comments
6/26	+	10				
27	+	10				
28	+	10	0	0		
29	1	11	0	0		
30	1	13	0	0		
7/ 1	53	66	0	0		
2	36	102	0	0	+	Very poor vis.; fish present 3-4 wide.
3	18	120	0	0	66	Very poor vis.; heavy in lower river.
4	13	133	0	0	24	Very poor vis.; spotty below.
5	13	147	5	5	4	Fair vis.; mostly schooled chums.
6	16	163	35	40		
7	12	175	51	92	1	Very poor vis.; mixed sockeye/chums.
8	22	197	47	139		
9	19	216	32	171		
10	10	227	27	198	5	Very poor vis.; minimal count.
11	7	233	14	212		
12	9	242	33	245		
13	5	247	33	278		
14	12	259	16	295		
15	23	282	9	304		
16	12	294	8	312		
17	8	303	5	317		
18	7	310	12	328		
19	3	313	27	355		
20	1	314	22	378		
21	2	315	23	401		
22	1	317	8	409		
23	1	318	4	413		
24	+	319	5	417		
25	1	320	5	422		
Total		322		429		

1/ Includes estimates of total salmon in clear water index areas in lower Nushagak River.

Table 36. Daily sockeye salmon tower counts and aerial survey escapement estimates, Togiak River, Bristol Bay, 1985.

		Enumeration Method in Thousands of Fish					
		Aerial Survey 1/					
Date	Tower Count		Togiak to Pung.	Pungokepuk to Ongi.	Ongivinuck to tower	Total	Comments
	Daily	Accum.					
7/ 5	+	+					
6	+	+					
7	+	+	-	400	400	800	Unacceptable vis.
8	+	+					(flood stage).
9	+	+					
10	+	1					
11	4	5	480	680	1,720	2,880	Poor visibility.
12	5	10					
13	6	15					
14	6	22	1,100	500	200	1,800	Very poor vis.
15	4	26					
16	3	29					
17	4	34	-	-	300	300	Poor visibility.
18	6	40					
19	5	44					
20	8	52	5,800	3,300	2,300	11,400	Fair visibility.
21	6	58					
22	8	66					
23	6	72					
24	8	80					
25	8	88					
26	11	99	5,600	10,500	4,200	20,300	Fair to good vis.;
27	6	105					estimate total
28	7	112					river at 60,000.
29	6	119					
30	5	123					
31	4	127					
8/ 1	4	131					
2	2	133					
3	1	135					
4	1	135					
5	+	136					
6	1	136					
7	+	137					
Total		137					

1/ Includes estimates of fish in clear water index areas immediately below the counting tower at the time of the survey.

Table 37. Aerial survey escapement estimates of sockeye and coho salmon by major river drainage, Togiak district, 1985.

Date	Aerial Estimate in Number of Fish 1/					
	Sockeye Salmon			Coho Salmon		
	Togiak River	Kulukak River	Tithe Creek 2/	Togiak River	Gechiak Creek	Kulukak River
7/ 7	800	3,800				
11	2,880	3,600	170			
14	1,800	1,300	400			
17	300					
20	11,400	13,300	2,500			
26	20,300		11,700			
8/22				200	20	100
27				4,800	250	5,000
9/ 2				12,300		6,000

1/ Escapement estimates are those fish sighted at time of the survey, generally an expansion factor of 2 to 3 will approximate the total spawning population.

2/ Tithe Creek/Ponds is the major producer of the Kanik River system.

Table 38. Commercial salmon processors and buyers operating by district, Bristol Bay, 1985. 1/

Name of Operator/Buyer	Base of Operations	Processing Method			Export		Comments
		Canned	Frozen	Cured	Fresh	Brine	
NAKNEK-KVICHAK DISTRICT							
1. Ak. Far East Corp.	Naknek		Shore				
2. Ak. Gourmet Seafoods	M/V Denali		Floater				
3. All Alaskan Seafoods	M/V All Alaskan and Pacific Apollo		Floater				
4. American Eagle Seafoods	M/V Aleutian Dragon		Floater				
5. American Salmon Co.					Air		
6. Bering Pacific Coop.	M/V Pribilof, Lafayette, Clipperton and Grizzly		Floater				Con. w/Lafayette
7. Bristol Monarch Corp.	Egegik and M/V Bristol Monarch		Shore & Floater				
8. Calista Fisheries	M/V Mokuhana		Floater				
9. Columbia-Wards Fish.	M/V Double Star		Floater				Tender to Ekuk.
10. Dragnet Fisheries	Dillingham and M/V Alaskan I		Floater		Air		
11. Dutch Harbor Seafoods	M/V Omnisea, Galaxy, Dipper and Viceroy		Floater			Sea	Tendered to Pt. Moller
12. Egegik Seafoods	Egegik					Sea	Tendered to Kodiak for canning.
13. Etolin Point Salmon Co.	Etolin Point				Air		
14. Evans Aviation	King Salmon				Air		
15. Fish West Co.	M/V West I		Floater				
16. Icicle Seafoods	P/V Arctic Star and Bering Star		Floater		Air		
17. Keener Packing Co.	Naknek				Air		
18. Kemp Pacific Fisheries	M/V Bering Trader and Dillingham		Floater				
19. Kenai Packers	Pederson Point		Shore		Air	Sea	Tendered to Kenai and Kodiak for canning.
20. Lafayette, Inc.	M/V Lafayette, Pribilof and Clipperton		Floater				Con. w/Bering Pacific.
21. Nelbro Packing Co.	Naknek	1-1 lb. 3-1/2 lb. 1-1/4 lb.	Shore				
22. New West Fisheries	M/V Northland		Floater				
23. North Coast Seafood, Inc.	M/V Polar Bear		Floater				
24. No. Peninsula Fish.	King Salmon				Air		
25. Northwind Fisheries	M/V Hawaiian Princess		Floater				
26. Nuka Point Fisheries	M/V Maren I & Polar Shell			Floater			
27. Pacific Star	King Salmon				Air		
28. Pelican Seafoods	M/V Polar Ice		Floater			Sea	Con. w/Ursin Seafoods; tendered to Sand Point for freezing.
29. Peter Pan Seafoods	P/V Arctic Star						
30. Polar Seafoods	Bering Star & M/V Omnisea		Floater			Sea	Tendered to King Cove and Dillingham.
31. Queen Fisheries	Naknek				Air		
32. Red Salmon Co.	Naknek	2 1-lb. 2 1/2 lb.	Shore		Air		Tendered to Dillingham. Con. w/So. Naknek Seafoods.
33. San Juan Seafoods	M/V American No. 1		Floater				
34. Sea Alaska Products	M/V Northern Shell and So. Naknek	1 1-lb. 3 1/2 lb.	Floater				Con. w/Trident and TPS Corp.
35. Sea Horse Seafoods	M/V Santa Anita		Floater				
36. Security Pacific	M/V Peregrine, Provider Orchrist, and Tiger		Floater				
37. Spectrum International	M/V Trident		Floater				
38. So. Naknek Seafoods	So. Naknek		Shore				Con. w/Red Salmon Co.

(continued)

Table 38. (continued)

Name of Operator/Buyer	Base of Operations	Processing Method			Export		Comments
		Canned	Frozen	Cured	Fresh	Brine	
<u>NARNEK-KVICHAK DISTRICT (continued)</u>							
39. TPS Corp.	M/V Victoria M.		Floater				Con. w/Sea Alaska Prod.
40. Trident Seafoods	P/V Neptune, M/V Bountiful, Tempest and Billikin		Floater			Sea	Con. w/Sea Alaska Prod. tendered to Akutak for freezing.
41. Ursin Seafoods	P/V Great Alaskan		Floater				Con. w/Pelican Seafoods.
42. Western Pioneer	M/V Wester Pioneer		Floater				
43. Westward Fisheries	Big Creek		Shore				Tendered to Big Creek
44. Whitney Fidalgo Seafoods	Naknek	1-1 lb.	Shore		Air		
		1-1/2 lb.					
45. Woodbine Ak. Fish. Co.	M/V Woodbine		Floater				
Total Naknek-Kvichak District:		4	35	1	13	6	freezing.
<u>EGEGIK DISTRICT</u>							
1. Alaska Far East Corp.	Naknek		Shore				Tendered to Naknek.
2. Alaska Gourmet Seafoods	M/V Denali		Floater				
3. Alaska Premium Seafoods	M/V Grizzly		Floater				Con. w/Bering Pacific
4. All Alaskan Seafoods	M/V All Alaskan, Pacific Apollo		Floater		Air		
5. American Eagle Seafoods	M/V Aleutian Dragon		Floater				
6. Bering Pacific Corp.	M/V Pribilof, Grizzly, Lafayette, & Clipperton		Floater				Con. w/Ak. Premium and Lafayette.
7. Bristol Monarch Corp.	Egegik and M/V Bristol Monarch		Shore				
			Floater				
8. Calista Fisheries	M/V Mokuhana		Floater				
9. Cash Fisheries	Bishop Creek				Air		
10. Columbia-Wards Fish.	Ekuk and M/V Double Star		Shore				Tendered to Ekuk.
			Floater				
11. Dagnet Fisheries	Dillingham and M/V Alaskan I		Shore		Air		Tendered to Dillingham.
			Floater				
12. Dutch Harbor Seafoods	M/V Omnisea, Dipper, Galaxy and Viceroy		Floater				
13. Egegik Seafoods	Egegik				Air	Sea	Tendered to Kodiak for canning.
14. FAVCO	Anchorage				Air		
15. Icicle Seafoods	P/V Arctic Star and Bering Star		Floater		Air		Proc.
					Air		
16. Int'l. Seafoods of Ak.	Egegik Beach				Air		
17. Keener Packing Co.	Naknek				Air		
18. Kemp Pacific Fisheries	M/V Bering Trader and Dillingham		Floater				
			Shore		Air		
19. Kenai Packers	Pederson Point		Shore			Sea	Tendered to Dillingham. Tendered to Kenai for canning.
20. Lafayette, Inc.	M/V Lafayette and Clipperton		Floater				Con. w/Bering Pacific. Canned in Naknek.
21. Nelbro Packing Co.	Naknek						
22. New West Fisheries	M/V Northland		Floater				
23. Northcoast Seafood Proc.	M/V Polar Bear		Floater				
24. Northwind Fisheries	M/V Hawaiian Princess		Floater				
25. Nuka Point Fisheries	M/V Maren I. & Polar Shell			Floater			
26. Oceanic Seafoods	M/V Pacific Harvest and Harvester		Floater				

(continued)

Table 38. (continued)

Name of Operator/Buyer	Base of Operations	Processing Method			Export		Comments
		Canned	Frozen	Cured	Fresh	Brine	
<u>EGEGIK DISTRICT (continued)</u>							
27. Pelican Seafoods	M/V Polar Ice		Floater			Sea	Con. w/Ursin Seafoods; Tendered to Sand Pt. for freezing.
28. Peter Pan Seafoods	Naknek and P/V Arctic Star, Bering Star, and M/V Omnisea		Floater				Tendered to Dillingham.
29. Queen Fisheries	Dillingham					Sea	Canned in Dillingham.
30. Red Salmon Co.	Naknek						Canned in Naknek; tendered to Alitak; con.w/So. Naknek Seafoods
31. San Juan Seafoods	M/V American No. 1		Floater				
32. Sea Alaska Products	So. Naknek and M/V Northern Shell		Floater				Con. w/TPS & Trident; tendered to So. Naknek.
33. Seahorse Seafoods	M/V Santa Anita		Floater				
34. Security Pacific Coop.	M/V Mariner, Orchrist		Floater				
35. Sno-Pac Products	M/V Snopac Alaska & Snopac		Floater				
36. So. Naknek Seafoods	South Naknek		Shore				Con. w/Red Salmon; tendered to So. Naknek for freezing.
37. Spectrum International	M/V Trident		Floater				
38. Seafood, 10th & M						Air	
39. TPS Corp.	M/V Victoria M		Floater				
40. Trident Seafoods	P/V Neptune, M/V Tempest Billiken, and Bountiful		Floater			Sea	Tendered to Akutan for freezing.
41. Ursin Seafoods	P/V Great Alaskan		Floater			Air	Con. w/Pelican Seafoods.
42. Western Fish Producers	M/V Nicolle N.		Floater				
43. Western Pioneer	M/V Western Pioneer		Floater				
44. Westward Fisheries	Big Creek		Shore			Air	
45. Westward Seafoods	M/V Westward		Floater				
46. Whitney-Fidalgo Seafoods	Naknek		Shore				Con. w/Ak. Far East; tendered to Naknek.
47. Woodbine Ak. Fish. Co.	M/V Woodbine		Floater				
Total Egegik District:		0	37	1	12	5	
<u>UGASHIK DISTRICT</u>							
1. Alaska Gourmet Seafoods	M/V Denali		Floater				
2. Alaska Premium Seafoods	M/V Grizzly		Floater				
3. All Alaskan Seafoods	M/V All Alaskan and Pacific Apollo		Floater			Air	
4. American Eagle Seafoods	M/V Aleutian Dragon		Floater				
5. Bering Pacific Coop.	M/V Pribilof, Grizzly Lafayette, & Clipperton		Floater				Con. w/ Ak. Premium Seafoods & Lafayette. Custom processed.
6. Briggs-Way Co.	Ugashik	1-5 oz. glass					
7. Bristol Monarch Corp.	Egegik and M/V Bristol Monarch		Shore				Tendered to Egegik.
8. Columbia-Wards Fisheries	Ekuk and M/V Double Star		Floater				Tendered to Ekuk.
9. Dragnet Fisheries	M/V Alaskan I		Floater				
10. Dutch Harbor Seafoods	M/V Omnisea, Galaxy Dipper, and Viceroy		Floater			Sea	Tendered to Dutch Harbor.
11. Egegik Seafoods	Egegik					Air	
12. Fish West Co.	M/V West I		Floater				

(continued)

Table 38. (continued)

Name of Operator/Buyer	Base of Operations	Processing Method			Export		Comments
		Canned	Frozen	Cured	Fresh	Brine	
UGASHIK DISTRICT (continued)							
13. Icicle Seafoods	P/V Arctic Star and Bering Star		Floater		Air		
14. Kemp Pacific Fisheries	Dillingham and M/V Bering Trader		Shore Floater		Air		Tendered to Dillingham.
15. Kenai Packers	Pederson Point		Shore				Tendered to Pederson Pt.
16. Lafayette, Inc.	M/V Lafayette and Pribilof		Floater				
17. New West Fisheries	M/V Northland		Floater				
18. North Coast Seafood Proc.	M/V Polar Bear		Floater				
19. No. Peninsula Fisheries	King Salmon				Air		Con. w/American Salmon Co.
20. Nuka Point Fisheries	M/V Maren I and Polar Shell			Floater			
21. Oceanic Seafoods	M/V Pacific Harvest and Harvester		Floater	Floater			
22. Pelican Seafoods	M/V Polar Ice		Floater			Sea	Con. w/Ursin Seafoods; tendered to Sand Pt. for freezing.
23. Peter Pan Seafoods	Naknek, Dillingham, and P/V Arctic Star, Bering Star, and M/V Omnisea		Floater				Tendered to Dillingham.
24. Queen Fisheries	Naknek and M/V Mr. B.		Floater				Tendered to Dillingham.
25. Sea Alaska Products	So. Naknek and M/V Northern Shell		Floater			Sea	Tendered to Dutch Harbor for freezing and So. Nakne for canning.
26. Sea Fisher Products	M/V Arctic Fisher		Floater				
27. Sea Horse Seafoods	M/V Western Sea		Floater				
28. Security Pacific Coop.	M/V Bold Venture		Floater				
29. Sno-Pac Products	M/V Snopac and Snopac Alaska		Floater				
30. Trident Seafoods	P/V Neptune, M/V Tempest Billiken, and Bountiful		Floater			Sea	Tendered to Akutan for freezing.
31. Western Fish Producers	M/V Nicolle N.		Floater				
32. Westward Fisheries	Big Creek		Shore				Tendered to Big Creek.
33. Westward Seafoods	M/V Westward		Floater				
34. Whitney-Fidalgo Seafoods	Naknek		Shore		Air	Sea	Con. w/Ak. Far East; tendered to Kodiak and Naknek.
35. Woodbine Ak. Fish Co.	M/V Woodbine		Floater				
Total Ugashik District:		1	31	2	6	5	

(continued)

Name of Operator/Buyer	Base of Operations	Processing Method			Export		Comments
		Canned	Frozen	Cured	Fresh	Brine	
<u>NUSHAGAK DISTRICT</u>							
1. Alaska Far East Corpo.	Naknek		Shore				Tendered to Naknek for freezing.
2. Ak. Gourmet Seafoods	M/V Denali		Floater				
3. All Alaskan Seafoods	M/V All Alaskan		Floater				
4. Columbia-Wards Fisheries	Ekuk	2-1 lb.	Shore		Air		
5. Dragnet Fisheries	Dillingham	2-1/2 lb.			Air		
6. Dutch Harbor Seafoods	Dillingham		Floater		Air		Frozen on M/V Galaxy, Dipper, Viceroy & Omisea
7. Etolin Point Salmon Co.	Etolin Pt.	1-1/2 lb.			Air		
8. Icicle Seafoods	Dillingham		Floater				Frozen on P/V Bering Star
9. Kemp Pacific Fisheries	Dillingham		Shore		Air		
10. Kenai Packers	Dillingham				Air		
11. Lafayette, Inc.	M/V Pribilof		Floater				
12. North Coast Seafood Proc.	M/V Polar Bear		Floater				
13. Nuka Pt. Fisheries	P/V Maren I			Floater			
14. Omni Enterprises	Dillingham						dba N & N Market, retail grocery store.
15. Peter Pan Seafoods	Dillingham	2-1 lb.	Floater		Air		Custom frozen on P/V Bering Star.
16. Queen Fisheries	Clarks Slough	2-1/2 lb.			Air		
		1-1 lb.					
		2-1/2 lb.					
17. Sea Ak. Products	Clarks Point	1-1/4 lb.	Floater				Frozen on M/V Alaska Shell.
18. Trident Seafoods	P/V Neptune		Floater				
19. Ursin Seafoods	P/V Great Alaskan		Floater				
20. Westward Seafoods	M/V Westward		Floater				
21. Woodbine Ak. Fish. Co.	M/V Woodbine		Floater				

<u>TOGIAC DISTRICT</u>							
1. Kemp-Paulucci Seafoods	Togiak				Air		
2. Togiak Fisheries	Togiak	1-1 lb.	Shore		Air		
		1-1/2 lb.					
Total Togiak District:		1	1	0	2	0	

FISHERY OPERATOR SUMMARY										
		Number of Operators					Number of Canning Lines 2/			
District	(Total)	Processing Method			Export					
		Canned	Frozen	Cured	Fresh	Brine	1 lb.	1/2 lb.	1/4 lb.	Total
Naknek-Kvichak	(45)	4	35	1	13	6	5	9	1	15
Egegik	(47)		37	1	12	5				
Ugashik	(35)	1	31	2	6	5		1		1
East Side	(56)	(5)	(42)	(2)	(21)	(9)	5	10	1	16
Nushagak	(21)	4	15	1	8		5	7	1	13
Togiak	(2)	1	1		2		1	1		2
West Side	(23)	(5)	(16)	(1)	(9)		6	8	1	15
TOTAL BAY	59	10	43	2	24	9	11	18	2	31

- 1/ Indicates operators with either a physical plant or processing facility in a district or those operators from other areas buying fish and/or providing tender and support service for fishermen in districts away from the facility.
- 2/ Number of canning lines available for operation.

Table 39. Case pack and commercial production of frozen and cured salmon by species and district, Bristol Bay, 1985. 1/

Category by District	No. Operators	Pack and Production 2/					Coho	Total
		Sockeye	King	Chum	Pink			
I. CASE PACK (in 48 - 1 lb. talls)								
Naknek-Kvichak	4	180,655	228	1,664				182,547
Egegik								
Ugashik	1	5	+				74	79
Nushagak	4	115,956	1,779	10,130			356	128,221
Togiak	1	1,268	250	6,573	15			8,106
Total	10	297,884	2,257	18,367	15		430	318,953
II. FROZEN (in pounds)								
Naknek-Kvichak	35	26,105,016	64,188	678,386 3/	89	21,842		26,869,521
Egegik	37	31,184,637	36,380	345,138 3/	7	54,597		31,620,759
Ugashik	31	29,403,454	181,975	533,893 3/	9	165,757		30,285,088
Nushagak	15	3,902,121	606,975	685,225	104	133,613		5,328,038
Togiak	1	723,739	349,457	327,125		91,631		1,491,952
Total	43	91,318,967	1,238,975	2,569,767	209	467,440		95,595,358
III. CURED (in pounds)								
Naknek-Kvichak	1	381,273	316	80				381,669
Egegik	1	200,549	184	4,460				205,193
Ugashik	2	1,465,296	3,607	39,147				1,508,050
Nushagak	1	11,960	1,237	6,925				20,122
Togiak								
Total	2	2,059,078	5,344	50,612				2,115,034
IV. TOTAL FROZEN AND CURED (in pounds)								
Naknek-Kvichak	36	26,486,289	64,504	678,466	89	21,842		27,251,190
Egegik	38	31,385,186	36,564	349,598	7	54,597		31,825,952
Ugashik	32	30,868,750	185,582	573,040	9	165,757		31,793,138
Nushagak	16	3,914,081	608,212	692,150	104	133,613		5,348,160
Togiak	1	723,739	349,457	327,125		91,631		1,491,952
Total	45	93,378,045	1,244,319	2,620,379	209	467,440		97,710,392

1/ Includes only fish processed in Bristol Bay.

2/ Pack and production data extracted primarily from "Final Operations Reports" (BB-CF/303), and from catch and production reports or fish tickets if unavailable in final report form.

3/ Included with sockeye production in many cases.

Table 40. Salmon transported out of the area for processing, by species and district, Bristol Bay, 1985. 1/

I. FRESH EXPORT BY AIR 2/ (in pounds)

District	No. Operators	Export in Pounds					Total
		Sockeye	King	Chum	Pink	Coho	
Naknek-Kvichak	13	3,522,881	50,531	176,132 3/	13	45,161	3,794,718
Egegik	12	4,583,665	26,860	108,846 3/	199	200,209	4,919,779
Ugashik	6	2,730,572	2,723	13,917 3/		9,131	2,756,343
Nushagak	8	912,310	418,809	76,434	3	124	1,407,680
Togiak	2	533,395	288,344	718,760	518	263,949	1,804,966
Total	24	12,282,823	787,267	1,094,089	733	518,574	14,683,486

II. BRINE EXPORT BY SEA 2/3/ (in number of fish and pounds)

District	Number		Number	
	Operators	Tenders	Fish	Pounds
Naknek-Kvichak	6	9	295,233	1,519,453
Egegik	5	12	479,548	2,799,585
Ugashik	5	5	199,045	1,202,701
Nushagak				
Togiak				
Total	9	26	973,826	5,521,739

- 1/ Includes all fish exported from Bristol Bay in either brine or refrigerated sea water by sea-going tenders, or by air transportation.
- 2/ Export information extracted primarily from "Final Operations Reports" (BB-CF/303), and from catch and production reports or fish tickets if unavailable in final report form.
- 3/ Some processors report mixed sockeye and chums and complete specie breakdown is generally not available until fish are final processed.

Table 41. Average round weight of the commercial salmon catch, by species and district, Bristol Bay, 1985.

District	Average Round Weight in Pounds 1/					Total
	Sockeye	King	Chum	Pink	Coho	
Naknek-Kvichak	5.62	19.04	6.62	4.05	7.04	
Egegik	5.78	17.27	6.60	3.67	7.65	
Ugashik	5.82	19.07	6.81	5.67	7.89	
Nushagak	5.88	16.90	6.30	5.25	7.28	
Togiak	6.50	19.26	7.51	4.13	9.13	
Weighted Average	5.75	17.86	6.76	4.21	8.03	
Total Weight of Catch, All Districts 2/	134,913	2,165	5,837	2	1,291	144,208

1/ Data extracted from "Bristol Bay Final Operations Report" (BB-CF/303) and "Bristol Bay Salmon Catch Reports" (BB-CF/301), and is weighted by the catch of each processor against the total catch.

2/ Total weight shown in thousands of pounds, and is derived from preliminary catch data.

Table 42. Price paid per pound and exvessel value of the commercial salmon catch, by species and district, Bristol Bay, 1985. 1/

I. <u>PRICE PAID PER POUND</u>						
District	Average Price Paid Per Pound 2/					
	Sockeye	King	Chum	Pink	Coho	
Naknek-Kvichak	\$.8258	\$1.0800	\$.3564	\$.2025 3/	\$.5719	
Egegik	.8607	1.0784	.3359	.2025 3/	.7489	
Ugashik	.8732	1.0846	.3392	.2500	.7234	
Nushagak	.7762	1.0517	.2901	.2318	.7210	
Togiak	.8079	.9377	.2699	.1963	.6808	
Weighted Average	\$.8469	\$1.0179	\$.3104	\$.2025	\$.7099	
II. <u>EXVESSEL VALUE</u>						
District	Total Exvessel Value in 1,000's of Dollars 4/					
	Sockeye	King	Chum	Pink	Coho	Total
Naknek-Kvichak	\$ 37,758	\$ 121	\$ 414	\$ +	\$ 31	\$ 38,325
Egegik	37,099	72	243	+	188	37,601
Ugashik	32,253	135	274	+	348	33,009
Nushagak	6,040	1,202	462	+	106	7,811
Togiak	1,105	675	418	+	244	2,442
Total	\$114,256	\$2,204	\$1,812	\$ +	\$ 916	\$119,188

1/ Data extracted from "Bristol Bay Final Operations Report" (BB-CF/303).

2/ Average price per pound derived from individual company price schedules and is weighted by the catch of each processor against the total catch.

3/ No pink prices reported; used overall weighted average.

4/ Preliminary catch in pounds times district average price; totals may not equal sum of district value due to rounding.

Table 43. Subsistence salmon catch by species, district and village area, Bristol Bay, 1985.

Area/River System	Permits Issued	Number of Fish					
		Sockeye	King	Chum	Pink	Coho	Total
NAKNEK-KVICHAK DISTRICT:							
Naknek River 1/	294	21,115	979	304	23	1,028	23,449
Kvichak River:							
Levelock	33	6,628	159	216	3	71	7,077
Igiugig	26	3,371	11	14		4	3,400
Newhalen 2/							
Nondalton	43	14,886					14,886
Port Alsworth	29	4,464					4,464
Iliamna	64	22,317	27				22,344
Pedro Bay	25	12,826					12,826
Kokhanok	30	21,936	3	6	1		21,946
Total	544	107,543	1,179	540	27	1,103	110,392
EGEGIK DISTRICT							
Egegik River 3/	23	582	14	21	1	203	821
UGASHIK DISTRICT							
Ugashik River 4/	9	233	17	7		143	400
NUSHAGAK DISTRICT							
Nushagak Bay 5/	305	13,293	3,363	1,698	231	4,360	22,945
Wood River 6/	18	1,529	50	32		27	1,638
Igushik River							
Manokotak	25	3,123	409	17		52	3,601
Nushagak River							
Portage Creek 7/							
Ekwok	12	4,566	1,122	461	284	575	7,008
New Stuyahok	37	9,911	2,350	1,156	75	1,041	14,533
Koliganek	9	5,556	572	632		30	6,790
Total	406	37,978	7,866	3,996	590	6,085	56,515
TOGLAK DISTRICT							
Togiak River 8/	51	3,445	599	1,005	83	1,464	6,596
TOTAL BRISTOL BAY	1,033	149,781	9,675	5,569	701	8,998	174,724

1/ Includes the communities of Naknek, South Naknek and King Salmon.

2/ Included in with Newhalen catches.

3/ Includes the villages of Egegik and North Egegik.

4/ Includes the villages of Pilot Point and Ugashik.

5/ Includes the communities of Dillingham, Kanakanak, Clarks Point, Clarks Slough, (Queen), Ekuk, Igushik Beach and the Lewis Point fish camps.

6/ Includes the village of Aleknagik.

7/ Included in with Nushagak Bay catches.

8/ Includes the villages of Togiak and Twin Hills.

ANNUAL MANAGEMENT REPORT

BRISTOL BAY HERRING,
HERRING SPAWN ON KELP AND
CAPELIN FISHERIES

1985

INTRODUCTION

The Bristol Bay sac roe herring fishery began in 1967 and was followed by the spawn on kelp fishery in 1968. The capelin fishery did not really develop until 1984, but small commercial deliveries date back to the 1960's. For the first 10 years effort levels and the number of processors remained small and the herring sac roe fishery did not operate in 1971 and 1976, due to poor market conditions.

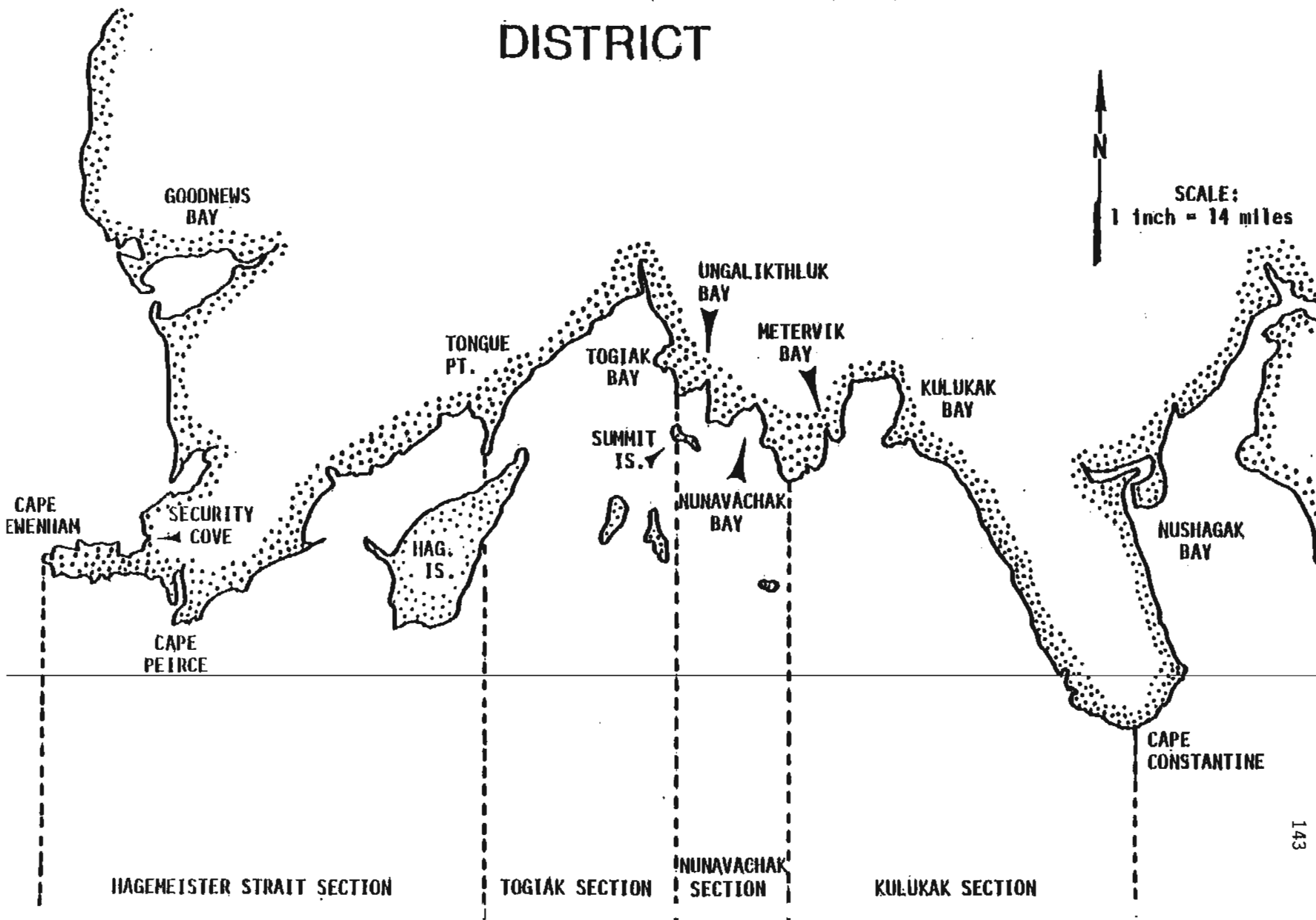
Favorable market conditions and additional incentives provided by the Fishery Conservation and Management Act of 1976 (the 200 mile limit) resulted in a major expansion of the Togiak herring fishery in 1977.

Herring have been reported in all districts of Bristol Bay, but the major concentration occurs in and around Togiak where the commercial fishery is centered (Figure 1). Legal gear types include purse seines, which are limited to 150 fathoms in length, and gill nets which are also limited to 150 fathoms, but two permit holders may both operate that amount of gear from a single vessel. The spawn on kelp harvest method is limited to hand picking or by hand held rakes.

Since 1981, the herring and spawn on kelp harvests have been regulated by emergency order, and the designated season occurs from April 25 to June 1. A regulatory management plan, 5 AAC 27.865, and a management directive to the staff, set the policies by which this fishery is managed (Appendix E).

Figure 1.

TOGIAK HERRING FISHING DISTRICT



The spawn on kelp management plan was revised prior to the 1984 season and sets the maximum allowable harvest at 350,000 pounds (Reference Spawn on Kelp Plan Appendix C, Page 225, Annual Management Report, 1984, Bristol Bay). The new plan further directs that the herring spawn on kelp harvest be included in calculating the total exploitation on this stock.

Because the capelin fishery is new and developing, few regulations restrict this activity and the management plan for this species mainly addresses additional protections for herring. (Reference capelin plan Appendix D, page 213, Annual Management Report, 1982, Bristol Bay).

1985 Inseason Herring/Kelp/Capelin Management

After a fairly mild winter, a late spring cold snap delayed the arrival of the fishing fleet and the first vessels were not on the grounds until May 6. Shore ice along the beaches and bad weather prevented the establishment of the first Department field camp until May 7. Aerial surveys were initiated on May 11, but the first herring were not sighted until May 19 (Table 1).

Test fishing began on May 13 with variable mesh gill nets and on May 18, with the help of a commercial gill net vessel, the first herring samples were obtained. These first samples proved to be large, old fish (mostly 7 and 8 year) and were still green (immature). On May 19, water temperatures ranged from a low of 34.5° F at Summit Island to a high of 37° F at Metervik Bay. By May 18 herring were landed at all three camp locations using gill nets, therefore indicating some buildup of volume over the entire area. On May 19 herring schools were beginning to show throughout the district and by evening, some commercial spotters were reporting as much as 20,000 short tons on the grounds.

On May 20, one gill netter and three purse seine vessels were deployed to test fish the areas with the highest reported concentrations of herring. The samples continued to be large, old herring and they were still green (immature). One gill net sample from the Metervik Bay area tested 4.9% mature roe and three small spawns were reported. The aerial count of the vessels in the Togiak area totaled 265 at this time, and more were arriving each hour. By May 21 the biomass was building rapidly and approaching 50,000 s. tons (Table 1). Two gill netters and four purse seine vessels were sent out to test fish, and the resulting samples were delivered to processors who volunteered to test the roe maturity. Three samples collected in the Eagle Bay area contained mature roe, and were estimated at 6.5%, 7.2% and 8.1%, respectively. Water temperatures on May 21 were 36.5° F at Summit Island and 40° F at Metervik Bay and Tongue Point.

By the morning of May 22 the fishing fleet had grown to 148 purse seine vessels and over 200 gill netters, while many local residents were still enroute. Due to the increased evidence of spawning, and the improving maturity of the samples, a fleet of eight purse seine vessels were dispatched throughout the district to test fish for roe maturity. These samples were collected at Nunavachak beach and publicly tested for roe maturity. A total of fourteen different samples were examined, and seven contained mature roe, ranging from 0.8% to 8.9%. Good numbers of large herring schools were beginning to show offshore between Hagemeister and High Island by the afternoon, and the biomass inshore was estimated at over 50,000 tons (Table 1).

A fleet of 12 test boats, including 3 gill netters and 9 purse seiners, were deployed the morning of May 23, to many areas of the district and the samples were again assembled for a public roe testing on the Nunavachak air-strip at noon. Only five of thirty bags tested did not contain mature roe and recoveries ranged from 0.9% to 10.4%. The herring roe maturity had dramatically

improved over the fish tested the previous day, and water temperatures in the near shore areas ranged from a low of 39 F to a high of 45 F. Over eleven miles of spawn were reported on the May 23 aerial survey and a large percentage of the herring in the district had moved to the beach and began to spread out in long bands along the shoreline. The biomass was estimated at over 86,000 s. tons on the same aerial survey, closely matching the preseason projection of 82,000 s. tons (Table 1). The age composition of the samples also matched the expected strong return of age 7 and 8 year herring (Table 4).

When the public roe testing on the beach was completed, the fleet was advised to standby for a possible fishing announcement. A low level aerial survey was conducted with the helicopter during the roe sampling and the fleet was estimated at 155 purse seiners and 302 gill netters. A representative of the Federal Aviation Administration discussed safety with pilots and passed out written materials when the large crowd was gathered on Nunavachak beach to observe the samples. After a careful review of the roe recoveries by area, weather reports, the biomass by section and the processor recommendations, it was decided that the first opening for the gill net fleet should be announced for that same evening, followed by a purse seine opening the next morning (Table 2). It was the concern of the staff at that time, that if the preseason projected biomass estimate was accurate, that all of the available herring were present on the grounds at that time. The rapid improvement in roe maturity and the high water temperatures prompted concern that a further delay of the commercial fishery might result in a very poor recovery, if a massive spawning took place prior to the harvest. Fishing time was limited to six hours for the gill net fleet and two hours for the purse seine fleet. It was felt that this minimal amount of fishing time would allow for an extended harvest at a later date if the initial roe recoveries were less than optimal.

The resultant harvest of 11,600 s. tons from the first opening was surprising in terms of the large volume landed per unit of effort, and disappointing in the quality of the roe recovery. In 1984 the seine fleet averaged 6.6 s. tons per unit per hour of fishing time, and for the first opening of 1985 they averaged 45.5 s. tons per unit per hour. The gill net fleet also increased their efficiency this season from 0.5 tons per unit per hour in 1984 to 1.3 tons in 1985. Gill net roe recovery for the first opening was estimated at 6.7% and purse seines at 9.2% for an overall weighted average of 8.7% (Table 3).

To prevent any potential covert activity on herring, the smelt (capelin) fishery was closed at 2:00 p.m., May 23, 1985 until further notice. By the evening of May 23 spawning was heavy in Ungalikthluk Bay and along the coast to Anchor Point. Aerial surveys of the purse seine fleet on May 24 gave the impression that the catch would also be very large. Catch reporting was rather slow and the lack of information required the staff to delay any decision on further fishing time until more complete data became available.

By late afternoon on May 24, spawning was reported in all areas of the district and the biomass was increasing. It was estimated that the harvest had exceeded 10,000 s. tons and that the exploitation rate was approximately 12%, still well within the Board of Fisheries guideline of 0 to 20%. The decision for the second opening was complicated by the large tide on the morning of May 25. To follow the Board directive required the gill net fleet to fish first, but to open on a falling tide with a 20 foot flood would leave many nets unrecoverable and could generate a considerable waste problem and much abandoned gear. To open on the second tide would delay the purse seine fishery until the next day (May 26). With the herring biomass obviously at the peak of spawning and the uncertainty of the weather, it was too much risk to delay that long. Therefore, the decision was to open the gill net fishery at 4:00 a.m., May 25, followed by the purse seine fleet at 1:00 p.m. (Table 2).

The 4:00 a.m. opening time brought considerable criticism from the gill netters who employed spotter aircraft, because of the darkness. As luck would have it, the skies were overcast with light rain and darkness was a problem at the onset of the fishery, but fortunately no accidents resulted. By mid-morning the weather had cleared and the purse seine fleet began moving toward the western end of the district. At the time of the purse seine opening, over 100 purse seine vessels were observed, in position, west of Tongue Point. The majority of the fleet were operating on a large school of herring located between the mouth of the Osviak River and Asigyukpak Spit.

The harvest for the second gill net opening brought less volume but much improved roe recovery and approximately 2,000 s. tons at 8.3% were reported (Table 3). The big surprise came from the purse seine fleet. With fishing time reduced to just one hour and over 9,000 tons landed by seiners on the first opening, the purse seine harvest was not expected to exceed 6,000 s. tons. However, the combination of perfect weather, an experienced efficient fleet, and a large volume of ripe herring in a very fishable location, resulted in a catch of over 12,000 s. tons with a reported 10.7% roe recovery (Table 3).

As of May 26 the total preliminary harvest to date was approximately 23,800 s. tons and the total biomass was estimated at 123,000 s. tons. When 1,500 s. tons was included for the anticipated kelp harvest the exploitation rate was approximately 20.6%, not including any estimate for waste. On the daily fleet report we announced that further fishing time was dependent upon the arrival of new biomass in the area.

Over 40 linear miles of spawn had been observed on the aerial surveys by May 26, and serious consideration was being given to a spawn on kelp fishery (Table 1). Samples of spawn on kelp were collected on the evening low tide on May 26 in Areas K-7 and K-8 (Figure 2), which had the greatest amount of observed spawn.

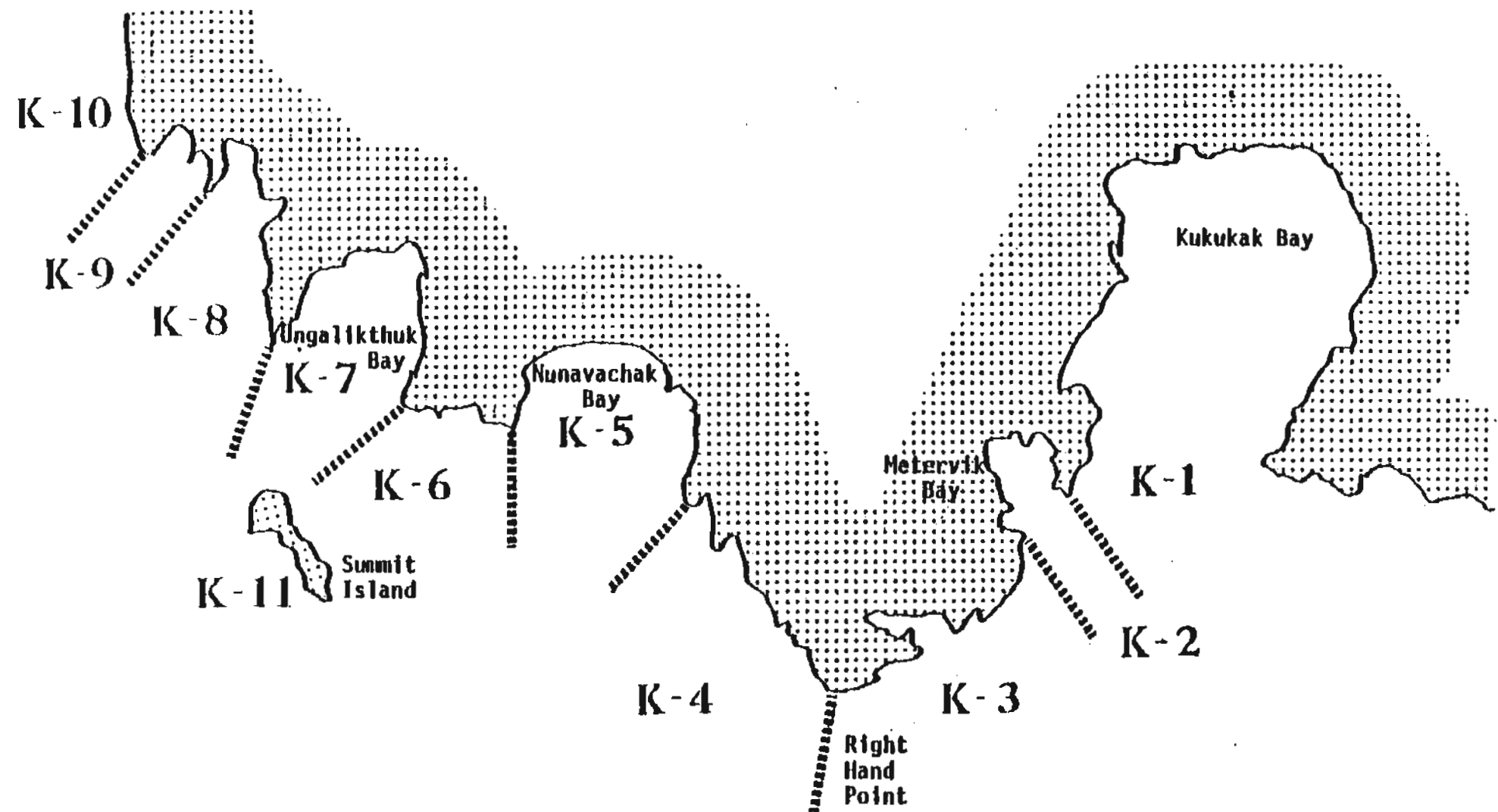


Figure 2.

HERRING SPAWN-ON-KELP MANAGEMENT AREAS (K-1 THROUGH K-11)

A meeting with interested kelp processors and fishermen was scheduled for the morning of May 27 to allow the industry to grade the samples and inspect the quality of the potential product. At the meeting, the technicians present felt that the egg cover was too sparse to be salable. All of the same companies had purchased kelp at Togiak during the 1984 season and were having trouble marketing their product due to low egg coverage. Therefore, all of the buyers present were unwilling to accept anything but number one quality in 1985. Because the samples were all graded number two, and to allow a harvest at the time would result in a large amount of unsalable product and a dumping problem, it was decided that the fishery should be delayed in the hope that subsequent spawns would improve the quality. During the interim, gale force winds occurred and little new spawn was observed.

On the evening low tide on May 28, more spawn on kelp samples were collected from several beach areas with the greatest amount of reported spawn. A considerable amount of spawn (loose eggs) were observed washed up on the west side of Ungalik-thluk Bay. These eggs were evidently dislodged from the eel grass beds by the heavy weather that had occurred the previous 24 hours. As the kelp samples were collected they were "taste tested" and eight of ten contained silt and were clearly less desirable than those collected the night of May 26, 48 hours earlier. A second kelp meeting was scheduled for noon on May 29 and the processors and the technicians that were in attendance confirmed that most of the samples were contaminated with silt and that some of the eggs had begun to "eye up", also making them unsalable. The kelp technicians advised the staff if a kelp opening were announced, they would grade the product closely and that the majority would have to be dumped.

Clearly the small potential economic gain to the participants, if a harvest were allowed, would not justify a major waste of the aquatic plants and viable spawn. At 2:00 p.m. on May 29, in a general announcement to the fleet, it was

declared that for the 1985 season, a spawn on kelp fishery would not occur. The Juneau Commercial Fisheries office was notified and the Commercial Fisheries Entry Commission, upon receipt of letter of certification from Headquarters, announced that refunds for unused spawn on kelp permits would be allowed.

Early on May 30 the weather was rough, with low overcast skies, but by mid-day, conditions had improved enough to launch a skiff and test fish with gill nets. Many vessels were leaving the fishing grounds and there was little interest in test fishing for the Department at that point. However, 32 vessels did assist with the test fishing efforts during the peak of the season.

On May 30 the smelt (capelin) fishery was reopened by emergency order. The two companies that had expressed interest in taking capelin both failed to land any product and left the area by early June. One of the operators had a joint venture permit with a Korean vessel, and their agreement fell through at the last moment. The same company had intended to take a small load of capelin for a market test, but due to bad weather, they were unable to locate significant biomass on their aerial surveys, so they left the grounds. The other processor reported "good numbers of capelin schools" in the area, but their samples were running 75 fish per unit compared to 45 per unit in 1984. The small sized fish were unacceptable to their market, so they also left the grounds.

One 10 pound capelin sample was obtained by the Department and later worked up in the Dillingham lab. The fish proved to be mostly three year olds with some two's present as well. As late as June 11 a National Oceanic and Atmospheric Administration (NOAA) helicopter crew, working the area, reported many capelin spawning and numerous carcasses on the west side of Tongue Point.

Enforcement this season was again provided by the Patrol Vessels Woldstad and Public Safety I, and most of the violations concerned early and late fishing and abandoned gill nets. By May 28, Public Safety reported issuing 12 citations, 14 warnings, and had made 185 contacts.

Problems continued in 1985 with solid waste (trash) pollution and many oil slicks. A Department of Environmental Conservation official came to the grounds and was housed aboard the P/V Woldstad, but the affect of his efforts was undetectable. Fortunately, no major accidents or loss of life occurred this season, and this was probably due to the near perfect weather during the fishery.

Generally speaking, the season went fairly well and the fishery progressed in an orderly manner. Some problems were reported by individual processors who took a large volume of herring and had difficulty processing it before the quality began to deteriorate. Two companies stripped small amounts of herring and dumped the carcasses, but the total amount was less than 400 s. tons. A large volume of fish (41%) were landed in the Hagemeister section (Table 5), with lesser portions in the other areas.

The gill net fleet accounted for 17.4% of the total catch with the purse seine fleet contributing 82.6% (Table 3). The overall herring exploitation rate was calculated at 19.7% of the final estimated spawning biomass of 131,400 s. tons, based on an adjusted total harvest of 25,900 s. tons (25,300 s. tons sac roe harvest plus 300 s. tons food herring harvest and 300 s. tons wastage).

Age 7 and 8 year old fish comprised over 75% of the harvest while age 4 and younger herring represented only 5% of the harvest (Figure 3). Although the relative proportion of young herring did increase slightly as the season progressed, separate abundance peaks for young and old herring was not evident, and was probably due to minimal recruitment of young fish into the spawning population. Good to excellent visibility conditions generally persisted during the peak of the season which allowed reliable aerial assessments to be made of the spawning biomass.

The exvessel value of the fishery was estimated to be \$13.8 million, a new record for the Togiak district and well above the \$10.5 million paid in 1983, the previous high. Prices paid ranged from a low of \$400 per s. ton at 10%

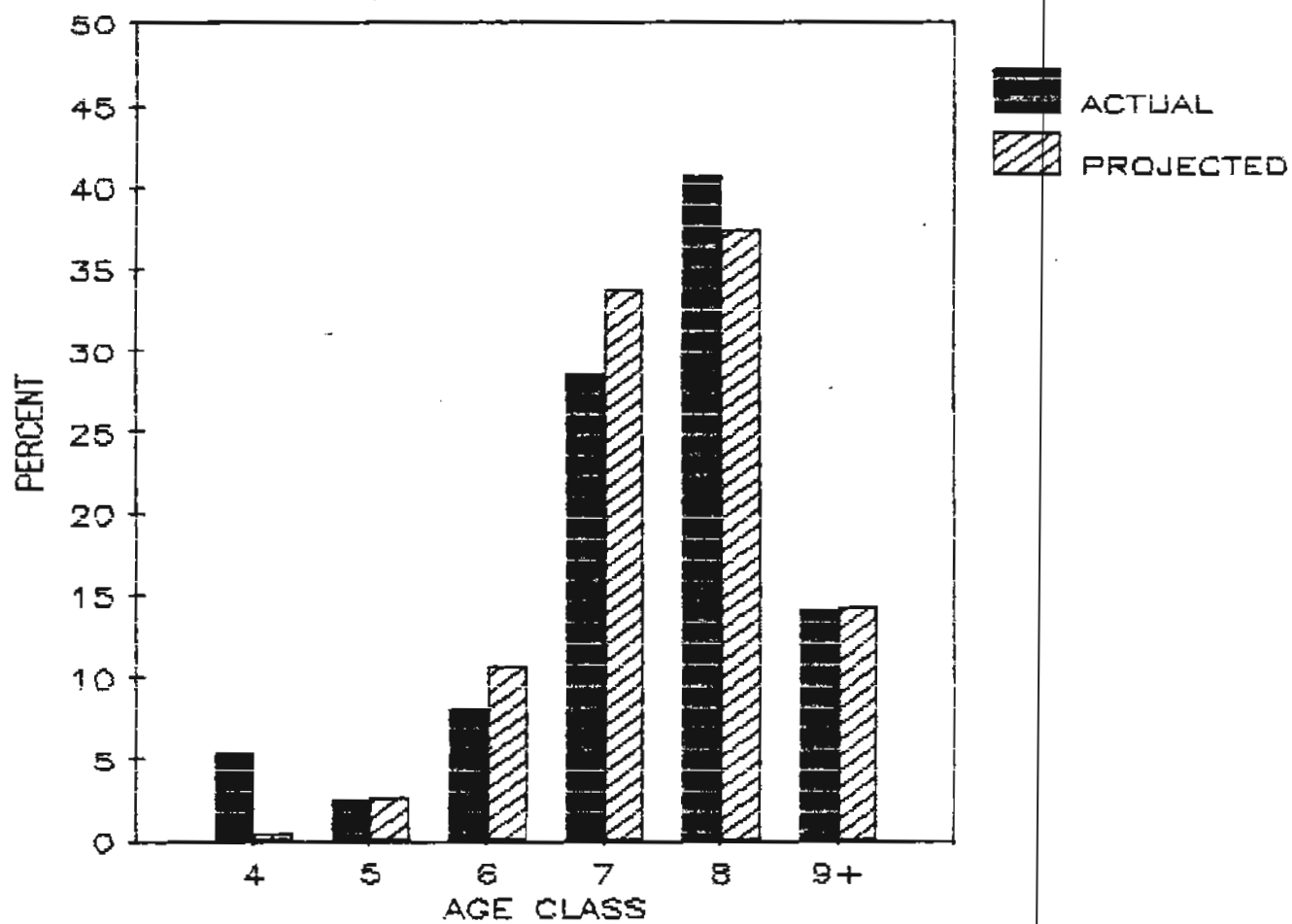


Figure 3. A comparison of the actual Togiak herring age composition vs. the preseason projection, Bristol Bay, 1985.

recovery to a high of \$950 per s. ton. Average price paid was \$571 per s. ton for 10% roe recovery with an increase or decrease of \$66 per s. ton for each percentage point above or below 10%. Average price paid for food and bait herring was \$149 per s. ton with prices ranging from a low of \$50 to a high of \$220 per s. ton.

TABLES

Table 1. Summary of herring aerial survey total run biomass estimates and observations of herring spawn, Togiak district, Bristol Bay, 1985.

Date	Survey Rating 1/	Census Area Surveyed 2/	Number Herring Schools Observed				Herring Biomass Est. 3/4/		Herring Spawn		
			Small	Med.	Large	Total	Formula	Staff	No.	Each	Accum.
5/11 (AM)	5	NUS									
12 (AM)	2/4	NUS-HAG									
15 (AM)	2/3	NUS-HAG									
19 (AM)	3/4	NUS-HAG	1	5	12	18	855	900			
20 (AM)	2/4	NUS-HAG	5	116	43	164	4,360	6,400	3	0.2	0.2
21 (PM)	2/4	NUS-HAG	6	749	367	1,122	38,535	42,200	6	1.7	1.9
21 (PM)	2/4	KUL-NUN		43	116	159	6,348	5,500	2	0.3	2.2
Composite of both 5/21 flights							40,881	44,000			
22 (AM)	3/5	NUS-TOG						13,000	4	0.4	2.6
22 (PM)	1/4	NUS-HAG	5	1,403	446	1,854	54,434	50,100	9	1.9	4.5
23 (AM)	2/3	NUS-UNG						15,000	15	3.0	7.5
23 (PM)	2/3	NUS-PYR	1	1,453	1,033	2,487	86,369	74,100	33	11.2	18.7
24 (PM)	2/3	NUS-PYR	63	1,030	964	2,057	76,548	73,600	25	11.7	30.4
25 (PM)	3/4	NUS-PYR		45	11	56	2,833		17	5.2	35.6
26 (AM)	4	NUS-OSV		1,180	123	1,303	50,715	43,300	23	7.3	42.9
29 (AM)	3/4	NUS-OSV		409	17	426	59,901	58,500			42.9
6/ 1 (AM)	3/4	NUS-OSV		10		10	40,129		4	0.5	43.4

- 1/ Survey rating: 1 = Excellent; 2 = Good; 3 = Fair; 4 = Poor; 5 = Unsatisfactory.
 2/ Inclusive census areas: NUS = Nushagak Peninsula; KUL = Kulukak; MET = Metervik; NUN = Nunavachak; UNG = Ungalikthluk; TOG = Togiak; TON = Tongue Point; MAT = Matogak; OSV = Osviak; HAG = Hagemeister; PYR = Pyrite Point; and CN = Cape Newenham.
 3/ Short tons.
 4/ Formula: Total RAI's x conversion factors of 1.52, 2.58, and 2.83 tons, by census area and fish density/distribution;
 Staff: Personal estimates by experienced Department spotters.

Table 2. Emergency order commercial herring sac roe and herring spawn on kelp fishing periods, Togiak district, Bristol Bay, 1985.

Emergency Orders

Number	K Area	Date, Time and Gear				Hours/Days Open	
<u>I. HERRING SAC ROE</u>							
DLG 01 1/	May 23	4:00 p.m.	- May 23	10:00 p.m.	Gill Net	6 hours	
	May 24	11:00 a.m.	- May 24	1:00 p.m.	Purse Seine	2 hours	
DLG 02	May 25	4:00 p.m.	- May 25	9:00 a.m.	Gill Net	5 hours	
	May 25	1:00 p.m.	- May 25	2:00 p.m.	Purse Seine	1 hour	
<u>II. HERRING SPAWN ON KELP</u>							
NO FISHERY OCCURRED DUE TO A LACK OF NO. 1 QUALITY PRODUCT.							

- 1/ Emergency Order No. DLG 01 also closed the smelt (capelin) fishery from 2:00 p.m. May 23 until further notice. Smelt fishing was late reopened by Emergency Order No. DLG 03 at 6:15 p.m. May 30, 1985 until 12:00 midnight, December 31, 1985.

Table 3. Inshore commercial herring catch and roe recovery by period and gear type, Togiak district, Bristol Bay, 1985.

Period	Time GV/PS	Short Tons			Metric Tons	Roe Percent			1/
		Gill Net	Purse Seine	Total		Gill Net	Purse Seine	Total	
5/23-24	6/ 2 hrs.	2,511	9,059	11,570	10,494	6.7	9.2	8.7	
5/25	5/ 1 hrs.	1,937	12,109	14,046	12,740	8.3	10.7	10.4	
Total	11/ 3 hrs.	4,448	21,168	25,616	23,234	7.4	10.0	9.6	
Percent of Catch		17.4	82.6	100.0					

1/ Weighted by catch and gear type.

Table 4. Herring total run biomass and inshore commercial catch by year class, Togiak district, Bristol Bay, 1985.

		Total Run and Catch by Year Class				Escapement in Short Tons
Year Class	Age	Total Run		Catch		
		Short Tons	Percent	Short Tons	Percent	
1976	9+	18,608	14	3,945	16	14,663
77	8	53,475	41	11,066	43	42,409
78	7	37,831	29	8,223	32	29,608
79	6	10,866	8	1,793	7	9,073
80	5	3,622	3	333	1	3,289
81	4	6,957	5	256	1	6,701
82	3	41	-	-	-	41
Total		131,400	100	25,616	100	105,784

Table 5. Inshore commercial herring catch by period and section, Togiak district, Bristol Bay, 1985.

Period	Catch by Section in Short Tons						Total
	Kulukak	Nunavachak	Togiak	Hagemeister	Pyrite Point	Cape Newenham	
May 23-24	2,987	1,989	3,998	2,062	410	124	11,570
(Percent)	(26%)	(17%)	(35%)	(18%)	(3%)	(1%)	
May 25	2,000	1,187	1,317	8,345	185	1,012	14,046
(Percent)	(14%)	(9%)	(9%)	(60%)	(1%)	(7%)	
Total	4,987	3,176	5,315	10,407	595	1,136	25,616
Percent of Catch	(20%)	(12%)	(21%)	(41%)	(2%)	(4%)	(100%)

Table 6. Commercial herring sac roe and herring spawn on kelp processors and buyers operating in the Togiak district, Bristol Bay, 1985. 1/

Name of Operator/Buyer	Base of Operations	Processing Method		Brine Export	Comments
		Frozen	Cured		
A. <u>HERRING SAC ROE</u>					
1. Alaska Herring Coop.	M/V Ebisu Maru	Floater			Joint venture w/U.S. gillnetters.
2. Alaska Premium Seafoods	M/V Grizzly	Floater			
3. All Alaskan Seafoods	M/V All Alaskan	Floater			
4. Blue Pacific	F/V Double Star	Shore/Floater		Sea	Tendered to Ekuk, So. Naknek, Egegik, D. Harbor and balance frozen on Double Star.
5. Bristol Monarch	M/V Bristol Monarch	Floater			
6. Coldwater Harvesters	F/V Little Comfort		Floater		
7. Fish West	M/V West I	Floater			
8. Icicle Seafoods	F/V Arctic Star	Floater			Some tendered for custom freezing.
9. JX Fisheries	M/V Pavlof	Floater			Tendered to Naknek.
10. Kemp Pacific Fisheries	M/V Bering Trader	Floater			Tendered to Dlg. for freezing.
11. Kemp Paulucci Seafoods	Togiak Village		Shore		Stripped at Togiak.
12. Kodiak King Crab	M/V Kodiak Queen			Sea	Tendered to Kodiak and Naknek for freezing.
13. New West Fisheries	M/V Northland	Floater			
14. Northcoast Seafood Proc.	M/V Polar Bear	Floater	Floater		Mostly frozen, but a small amount stripped on grounds.
15. Northwind Fisheries	M/V Hawaiian Princess	Floater			
16. Oceanic Seafoods	M/V Pacific Harvest	Floater			
17. Pelican Seafoods	M/V Polar Ice	Floater			Tendered to Sand Pt.
18. Sea Roe Fisheries	M/V Pribilof	Floater			
19. Seward Marine Services	M/V Odyssey			Sea	Tendered to Seward.
20. Togiak-Nuka Point	Togiak Fisheries		Shore		Tendered to Ekuk, Togiak Fish., and Pederson Pt. for freezing.
21. Trident Seafood Corp.	M/V Bountiful	Floater		Sea	Tendered to Akutan, the balance frozen on grounds.
22. Ursin Seafoods	M/V Axel D.			Sea	Tendered to Kodiak.
23. Western Fish Producers	M/V Nicolle N.	Floater			
Total Togiak District:		18	3	5	
B. <u>HERRING SPAWN ON KELP</u>					
1. Coldwater Harvesters	F/V Little Comfort		Floater		These companies were registered to purchase herring spawn on kelp, but due to lack of #1 quality no harvest occurred in 1985.
2. Kemp Paulucci Seafoods	Togiak		Shore		
3. Northcoast Seafood Proc.	F/V Polar Bear		Floater		
4. Nuka Point Fisheries	F/V Marin I		Floater		
Total Togiak District:			4		

1/ Indicates operators with either a physical plant or processing facility in a district or those operators from other areas buying herring or kelp and for providing tender and support service for fishermen in areas away from the facility.

SALMON AND HERRING APPENDIX

APPENDIX A

BRISTOL BAY SALMON MANAGEMENT OUTLOOK FOR 1985

The inshore sockeye salmon forecast for 1985 of 35.0 million will allow a potential commercial harvest of 20.3 million after escapement requirements are met (Table 1). The combined sockeye escapement goals for all eleven of the major river systems in Bristol Bay total 14.8 million, and an escapement goal of 10.0 million will be the management strategy selected for the Kvichak River.

The projected sockeye harvest of 20.3 million fish is slightly more than the average catch of 18.4 million for the previous comparable four cycle year average. Ultimate fishing time allowed in the various districts will depend upon actual run strength; however, early season fishing time will be necessary to gauge district run strength and to allow the processors and fishermen adequate break in time for an efficient operation.

King and chum salmon returns are expected to be strong as well, producing a total harvest in excess of 150,000 and 1.0 million, respectively. The coho salmon return will likely be variable. A good parent year escapement was achieved in the Nushagak district (180,000 in 1981), but the Togiak district parent year escapement and total run (61,000 and 90,000, respectively) may result in a coho run much smaller than the large run experienced in 1984. An inadequate escapement data base does not allow run size projections for Naknek-Kvichak, Egegik or Ugashik districts. Pink salmon do not return in significant numbers during odd years in Bristol Bay.

APPENDIX B

BRISTOL BAY SOCKEYE SALMON FORECAST EVALUATION FOR 1985 (Informational Leaflet No. 247, April 1985).

Until 1983, the annual preseason forecast used by the Alaska Department of Fish and Game (ADF&G) was calculated as the unweighted average of estimates obtained from spawner-recruit relationships, sibling age class returns, and smolt production-survival estimates for individual age classes and river-lake systems. Forecasts obtained from this method, referred to as the standard ADF&G method, have usually been within 47% of actual total run size. Other forecast methods have also been developed by ADF&G, but, while average performance of some of these has been better than the standard ADF&G method, year to year reliability has been inconsistent. Beginning in 1983, attempts were made to improve forecast reliability by pooling results from the standard ADF&G method with results from some of the other available forecast methods. Although only two years of data are available for comparison, results of these attempts were promising since forecasts for both years were within about 25% of actual total run size. The 1985 preseason forecast is for a total return of 35.0 million sockeye salmon, based upon the weighted mean of the results of two methods: (1) Standard ADF&G and (2) Japanese Research Catches (Appendix B, Table 1).

Appendix B, Table 1. Comparison of total forecast returns of major age classes of sockeye salmon to Bristol Bay, 1985.

Age Class	Predicted Returns (Millions)		
	Standard ADF&G	Japanese Research Catches	Weighted Mean
4(2)	3.1 (12%)	10.2 (24%)	6.0 (17%)
5(3)	9.4 (37%)	23.9 (57%)	18.3 (52%)
5(2)	6.7 (27%)	6.2 (15%)	5.6 (16%)
6(3)	6.1 (24%)	1.6 (4%)	5.1 (15%)
Total	25.3 (100%)	41.9 (100%)	35.0 (100%)

Appendix B, Table 2. Synopsis of forecasted returns of major age classes of sockeye salmon to Bristol Bay, 1985.

System	Age Class	Forecast (thousands)	Summary of Indicators	Possible Deviation
Kvichak	4(2)	0.9	Low escapement, low return per spawner; low smolt; no 3(2) return in 1984; high two-ocean component in research catch	LOWER RETURN
	5(3)	7.8	Second largest escapement; low smolt; low 4(3) return in 1984; high two-ocean component in research catch	HIGHER RETURN
	5(2)	1.3	Second largest escapement; high smolt; low 4(2) return in 1984; low three-ocean component in research catch	UNKNOWN
	6(3)	2.1	High return per spawner; moderate smolt; moderate 5(3) return in 1984; low three-ocean component in research catch; return would be second largest on record	LOWER RETURN
Branch	4(2)	0.1	Moderate return per spawner; no 3(2) return in 1984; high two-ocean component in research catch	UNKNOWN
	5(3)	0.2	Moderate return per spawner; no 4(3) return in 1984; high two-ocean component in research catch	UNKNOWN
	5(2)	0.1	Moderate return per spawner; moderate 4(2) return in 1984; low three-ocean component in research catch	UNKNOWN
	6(3)	0.04	High return per spawner; moderate 5(3) return in 1984; low three-ocean component in research catch	UNKNOWN

(continued)

APPENDIX B (continued)

Appendix B, Table 2 (continued)

System	Age Class	Forecast (thousands)	Summary of Indicators	Possible Deviation
Naknek	4(2)	1.1	High escapement; moderate return per spawner; high smolt; moderately high 3(2) return in 1984; high two-ocean component in research catch	UNKNOWN
	5(3)	2.0	Record escapement; moderate return per spawner assumed; possible low smolt; moderate 4(3) return in 1984; high two-ocean component in research catch	LOWER RETURN
	5(2)	1.0	Record escapement; moderate return per spawner assumed; possible very high smolt; moderate 4(2) return in 1984; low three-ocean component in research catch	HIGHER RETURN
	6(3)	0.8	High return per spawner; possible low smolt; moderate 5(3) return in 1984; low three-ocean component in research catch	UNKNOWN
Egegik	4(2)	0.3	Moderate return per spawner; possible low smolt; no 3(2) return in 1984; high two-ocean component in research catch	LOWER RETURN
	5(3)	4.1	Moderate return per spawner; possible low smolt; high 4(3) return in 1984; high two-ocean component in research catch	UNKNOWN
	5(2)	0.7	Moderate return per spawner; possible high smolt; high 4(2) return in 1984; low three-ocean component in research catch	HIGHER RETURN
	6(3)	1.5	High return per spawner; possible low smolt; high 5(3) return in 1984; low three-ocean component in research catch	LOWER RETURN

(continued)

APPENDIX B (continued)

Appendix B, Table 2. (continued)

System	Age Class	Forecast (thousands)	Summary of Indicators	Possible Deviation
Ugashik	4(2)	0.9	High escapement; moderate return per spawner assumed; possible moderate smolt; moderate 3(2) return in 1984; high two-ocean component in research catch	HIGHER RETURN
	5(3)	3.4	Record escapement; moderate return per spawner assumed; possible low smolt; high 4(3) return in 1984; high two-ocean component in research catch; 1985 5(3) return would be largest on record	LOWER RETURN
	5(2)	0.8	Record escapement; moderate return per spawner assumed; moderate 4(2) return in 1984; low two-ocean component in research catch	UNKNOWN
	6(3)	0.5	High escapement; high return per spawner assumed; moderate 5(3) return in 1984; low two-ocean component in research catch	LOWER RETURN
Wood	4(2)	1.0	Moderate return per spawner; moderate smolt; no 3(2) return in 1984; high two-ocean component in research catch	LOWER RETURN
	5(3)	0.5	Record escapement; moderate smolt; no 4(3) return in 1984; high two-ocean component in research catch	LOWER RETURN
	5(2)	0.8	Record escapement; moderate smolt; moderate 4(2) return in 1984; low three-ocean component in research catch	UNKNOWN
	6(3)	0.1	High return per spawner; low smolt; low 5(3) return in 1984; low three-ocean component in research catch	LOWER RETURN

(continued)

APPENDIX B (continued)

Appendix B, Table 2. (continued)

System	Age Class	Forecast (thousands)	Summary of Indicators	Possible Deviation
Igushik	4(2)	0.2	High escapement; low return per spawner assumed; no 3(2) return in 1984; high two-ocean component in research catch	UNKNOWN
	5(3)	0.02	Record escapement; very low return per spawner assumed; no 4(3) return in 1984; high two-ocean component in research catch	UNKNOWN
	5(2)	0.06	Record escapement; very low return per spawner assumed; low 4(2) return in 1984; low three-ocean component in research catch	UNKNOWN
	6(3)	0.04	High escapement; low 5(3) return in 1984; low three-ocean component in research catch	LOWER RETURN
Nuyakuk	4(2)	1.1	High return per spawner; low smolt; no 3(2) return in 1984; high two-ocean component in research catch	LOWER RETURN
	5(3)	0.06	Record escapement; low return per spawner assumed; low smolt; no 4(3) return in 1984; high two-ocean component in research catch	UNKNOWN
	5(2)	0.5	Record escapement; low return per spawner assumed; no 4(3) return in 1984; low three-ocean component in research catch	UNKNOWN
	6(3)	-0.03	High return per spawner; moderate 5(3) return in 1984; low three-ocean component in research catch	UNKNOWN

(continued)

APPENDIX B (continued)

Appendix B, Table 2. (continued)

System	Age Class	Forecast (thousands)	Summary of Indicators	Possible Deviation
Togiak	4(2)	0.4	Second largest escapement; moderate return per spawner; no 3(2) return in 1984; high two-ocean component in research catch	UNKNOWN
	5(3)	0.2	Record escapement; moderate return per spawner assumed; no 4(3) return in 1984; high two-ocean component in research catch	UNKNOWN
	5(2)	0.3	Record escapement; moderate return per spawner assumed; low 4(2) return in 1984; low three-ocean component in research catch	LOWER RETURN
	6(3)	0.03	High return per spawner; low 5(3) return in 1984; low three-ocean component in research catch	UNKNOWN

APPENDIX C. BRISTOL BAY TIDE TABLES, MAY - SEPTEMBER, 1985.

MUSHAGAK DISTRICT
CORRECTION TABLE

To correct the TIME and HEIGHT for
HIGH or LOW tides for the points given below,
add or subtract TIME and FEET from
the MUSHAGAK District Tide Table.

	Time	Feet
BRISTOL BAY		
Port Moller	+33	+1.5
Chukchi Point	+33	+1.5
Port Haden	+33	+1.5
ROKIN RIVER		
Entrance	+13	+1.2
Epilote	+14	+1.2
Widie Bluff	+14	+1.2
Kivichak Bay	+14	+1.2
HANKEE RIVER		
Entrance	+18	+1.2
Marshall Point	+18	+1.2
Chukchi Point	+18	+1.2
Rahmet Air Base	+18	+1.2
KIVICHAK RIVER		
Entrance	+18	+1.2
Kivichak	+18	+1.2
Kivichak	+18	+1.2
Kivichak	+18	+1.2
MUSHAGAK BAY		
Proclamation Point	+18	+1.2
Snag Point	+18	+1.2
Black Point	+18	+1.2
ST. LAWRENCE ISLAND		
Northeast Cap	+18	+1.2
Southwest Cap	+18	+1.2
Entrance	+18	+1.2

Use Low water table before 1985.
* Multiply height of station 7.00 by proper
ratio to correct height of tide.



HIGH Tides MUSHAGAK District

MAY 1985

Date	Day	Time	Feet
1	Wed	0:03 15.7	12.38 19.6
2	Thur	1:09 17.0	1:25 19.2
3	Fri	2:14 18.6	2:12 18.6
4	Sat	3:17 20.2	3:05 19.0
5	Sun	4:19 21.6	3:57 17.3
6	Mon	5:21 22.8	4:53 16.8
7	Tues	6:20 23.5	5:51 16.3
8	Wed	7:16 23.8	6:50 15.9
9	Thur	8:14 23.7	7:53 15.7
10	Fri	9:07 23.1	8:58 15.4
11	Sat	10:00 22.3	9:59 15.2
12	Sun	10:51 21.4	11:01 15.3
13	Mon	11:39 20.2	12:01 15.3
14	Tues	12:24 18.4	12:27 15.0
15	Wed	1:04 15.7	1:08 17.8
16	Thur	2:03 16.7	1:47 18.5
17	Fri	2:58 16.9	2:29 18.4
18	Sat	3:50 17.6	3:05 18.1
19	Sun	4:36 18.2	3:43 18.5
20	Mon	5:18 18.8	4:18 18.8
21	Tues	6:00 19.3	4:57 19.3
22	Wed	6:39 19.7	5:38 19.7
23	Thur	7:17 20.0	6:18 19.1
24	Fri	7:56 20.3	7:01 19.2
25	Sat	8:35 20.5	7:58 19.6
26	Sun	9:14 20.6	8:51 19.2
27	Mon	9:53 20.6	9:37 19.0
28	Tues	10:33 20.4	10:36 18.9
29	Wed	11:15 20.0	
30	Thur	0:01 15.7	NOON 18.4
31	Fri	1:07 18.3	12:46 18.7

NOON
* ADDS THE DAY - BETTER THE MONTH

LOW Tides MUSHAGAK District

MAY 1985

Date	Day	Time	Feet
1	Wed	6:23 2.1	7:13 2.0
2	Thur	7:22 2.8	7:59 0.8
3	Fri	8:26 3.5	8:51 -1.0
4	Sat	9:30 4.1	9:40 -2.4
5	Sun	10:33 4.5	10:34 -3.8
6	Mon	11:36 4.7	11:27 -3.8
7	Tues		12:18 4.7
8	Wed	0:23 -3.9	1:14 4.8
9	Thur	1:17 -3.4	2:13 4.0
10	Fri	2:15 -2.6	3:19 4.9
11	Sat	3:13 -1.4	4:22 5.9
12	Sun	4:07 0.0	5:14 5.7
13	Mon	5:03 1.5	6:03 5.9
14	Tues	6:01 3.0	6:53 5.9
15	Wed	6:57 4.3	7:37 5.1
16	Thur	7:52 5.5	8:18 4.1
17	Fri	8:49 6.5	9:08 4.9
18	Sat	9:45 7.1	9:59 5.5
19	Sun	10:38 7.5	10:15 5.7
20	Mon	11:27 7.7	10:54 5.7
21	Tues	12:18 7.7	11:33 5.1
22	Wed		1:03 7.1
23	Thur	0:12 1.0	1:48 7.5
24	Fri	0:51 1.0	2:24 7.1
25	Sat	1:33 1.0	3:11 6.4
26	Sun	2:21 1.1	3:51 5.7
27	Mon	3:10 1.5	4:31 4.5
28	Tues	4:03 2.1	5:14 3.0
29	Wed	5:01 3.0	5:59 1.3
30	Thur	6:03 3.9	6:47 -0.4
31	Fri	7:06 4.8	7:33 -2.0

NOON
* ADDS THE DAY - BETTER THE MONTH

DAYLIGHT ALASKA TIME

HIGH Tides MUSHAGAK District

JUNE 1985

Date	Day	Time	Feet
1	Sat	2:09 20.0	1:38 18.0
2	Sun	3:11 21.5	2:37 17.3
3	Mon	4:10 22.7	3:28 16.8
4	Tues	5:09 23.5	4:27 16.0
5	Wed	6:05 23.8	5:27 15.6
6	Thur	7:00 23.7	6:31 15.2
7	Fri	7:52 23.3	7:34 14.8
8	Sat	8:43 22.6	8:37 14.7
9	Sun	9:32 21.7	9:41 14.7
10	Mon	10:15 20.6	10:43 14.8
11	Tues	10:59 19.4	11:43 15.2
12	Wed	11:41 18.2	
13	Thur	0:45 16.0	12:18 16.8
14	Fri	1:39 16.7	12:56 15.8
15	Sat	2:33 17.5	1:33 14.8
16	Sun	3:21 18.3	2:12 13.9
17	Mon	4:07 18.9	2:51 13.3
18	Tues	4:46 19.4	3:29 12.8
19	Wed	5:28 19.9	4:11 12.5
20	Thur	6:08 20.3	4:57 12.3
21	Fri	6:47 20.6	5:48 12.4
22	Sat	7:26 20.8	6:41 12.7
23	Sun	8:03 20.9	7:39 13.2
24	Mon	8:40 20.8	8:44 14.0
25	Tues	9:21 20.7	9:47 15.2
26	Wed	10:01 20.2	10:53 16.5
27	Thur	10:45 19.6	11:58 18.2
28	Fri	11:31 18.9	
29	Sat	1:00 19.7	12:22 18.2
30	Sun	2:00 21.0	1:15 17.5

NOON
* ADDS THE DAY - BETTER THE MONTH

LOW Tides MUSHAGAK District

JUNE 1985

Date	Day	Time	Feet
1	Sat	8:13 5.4	8:24 -3.3
2	Sun	9:16 5.8	9:17 -4.2
3	Mon	10:19 5.9	10:08 -4.8
4	Tues	11:21 5.8	11:03 -4.4
5	Wed		12:21 -4.5
6	Thur	0:00 -3.8	1:19 3.0
7	Fri	0:54 -2.8	2:15 4.3
8	Sat	1:50 -1.5	3:07 3.8
9	Sun	2:45 0.0	3:59 3.3
10	Mon	3:41 1.6	4:48 2.7
11	Tues	4:36 3.3	5:33 2.1
12	Wed	5:29 4.8	6:18 1.5
13	Thur	6:26 6.0	6:57 1.1
14	Fri	7:23 7.0	7:38 0.8
15	Sat	8:19 7.7	8:18 0.3
16	Sun	9:15 8.1	8:58 0.3
17	Mon	10:07 8.3	9:37 0.2
18	Tues	10:58 8.3	10:18 0.2
19	Wed	11:47 8.2	10:58 0.3
20	Thur	12:32 8.0	11:40 0.2
21	Fri		1:17 7.9
22	Sat	0:25 0.4	1:59 6.7
23	Sun	1:10 0.7	2:40 5.7
24	Mon	1:59 1.3	3:20 4.8
25	Tues	2:51 2.1	4:02 3.8
26	Wed	3:40 3.2	4:48 2.8
27	Thur	4:49 4.3	5:32 -0.9
28	Fri	5:52 5.3	6:21 -2.4
29	Sat	6:56 6.1	7:11 -3.8
30	Sun	8:00 6.5	8:04 -4.3

NOON
* ADDS THE DAY - BETTER THE MONTH

DAYLIGHT ALASKA TIME

HIGH Tides MUSHAGAK District

JULY 1985

Date	Day	Time	Feet
1	Mon	3:03 22.1	2:10 14.6
2	Tues	3:58 22.7	3:08 15.2
3	Wed	4:54 23.0	4:09 15.8
4	Thur	5:49 23.0	5:10 15.1
5	Fri	6:40 22.6	6:13 14.6
6	Sat	7:29 22.0	7:13 14.5
7	Sun	8:15 21.3	8:17 14.5
8	Mon	8:59 20.3	9:18 14.7
9	Tues	9:38 19.3	10:18 15.1
10	Wed	10:16 18.1	11:17 15.7
11	Thur	10:52 17.1	
12	Fri	0:12 16.4	11:30 16.1
13	Sat	1:03 17.2	12:09 15.3
14	Sun	1:53 17.9	12:48 14.6
15	Mon	2:42 18.5	1:24 14.0
16	Tues	3:26 19.0	2:08 13.8
17	Wed	4:10 19.5	2:52 13.4
18	Thur	4:52 19.9	3:29 13.3
19	Fri	5:33 20.2	4:11 13.3
20	Sat	6:11 20.5	5:10 12.8
21	Sun	6:50 20.6	6:30 14.1
22	Mon	7:29 20.5	7:33 14.9
23	Tues	8:08 20.3	8:28 16.0
24	Wed	8:50 19.9	9:41 17.3
25	Thur	9:34 19.4	10:48 18.6
26	Fri	10:23 18.8	11:47 19.8
27	Sat	11:11 18.2	
28	Sun	0:49 20.8	12:04 17.6
29	Mon	1:48 21.5	1:00 17.0
30	Tues	2:47 22.8	1:58 18.5
31	Wed	3:43 21.9	3:00 15.5

NOON
* ADDS THE DAY - BETTER THE MONTH

DAYLIGHT ALASKA TIME

LOW Tides MUSHAGAK District

JULY 1985

Date	Day	Time	Feet
1	Mon	9:03 6.7	8:57 -4.8
2	Tues	10:04 6.6	9:52 -4.3
3	Wed	11:03 6.3	10:47 -3.7
4	Thur	12:02 5.8	11:40 -2.7
5	Fri		12:57 3.2
6	Sat	0:35 -1.4	1:49 4.5
7	Sun	1:27 0.1	2:42 3.8
8	Mon	2:20 0.7	3:27 3.1
9	Tues	3:12 3.2	4:12 2.4
10	Wed	4:07 4.7	4:54 1.7
11	Thur	5:01 6.0	5:25 1.3
12	Fri	5:55 7.0	6:15 0.8
13	Sat	6:50 7.7	6:55 0.4
14	Sun	7:44 8.2	7:37 0.1
15	Mon	8:37 8.5	8:18 -0.1
16	Tues	9:29 8.6	9:01 -0.3
17	Wed	10:19 8.5	9:43 -0.4
18	Thur	11:07 8.2	10:28 -0.3
19	Fri	11:53 7.6	11:14 -0.1
20	Sat		12:35 6.8
21	Sun	0:00 0.3	1:20 5.5
22	Mon	0:51 1.0	2:03 4.0
23	Tues	1:47 1.9	2:48 2.3
24	Wed	2:43 3.0	3:32 0.8
25	Thur	3:40 4.3	4:18 -0.3
26	Fri	4:43 5.1	5:08 -2.5
27	Sat	5:43 5.9	6:00 -3.4
28	Sun	6:45 6.4	6:53 -3.8
29	Mon	7:49 6.8	7:47 -4.0
30	Tues	8:49 6.6	8:42 -3.8
31	Wed	9:48 6.4	9:38 -2.9

NOON
* ADDS THE DAY - BETTER THE MONTH

DAYLIGHT ALASKA TIME

HIGH Tides MUSHAGAK District

AUGUST 1985

Date	Day	Time	Feet	ft	Time	ft
1	Thur	4:37	21.8		4:00	15.3
2	Fri	5:28	21.4		5:00	15.1
3	Sat	6:16	20.8		6:00	14.8
4	Sun	7:02	20.1		7:02	14.8
5	Mon	7:41	19.2		7:58	15.0
6	Tues	8:20	18.3		8:58	15.4
7	Wed	8:57	17.4		9:48	15.9
8	Thur	9:31	16.5		10:41	16.5
9	Fri	10:09	15.8		11:30	17.1
10	Sat	10:45	15.2			
11	Sun	0:19	17.6		11:26	14.8
12	Mon	1:08	18.1		12:05	14.3
13	Tues	1:55	18.5		12:48	14.3
14	Wed	2:40	18.9		1:35	14.2
15	Thur	3:24	19.1		2:26	14.3
16	Fri	4:08	19.6		3:17	14.5
17	Sat	4:47	19.7		4:17	14.9
18	Sun	5:31	19.8		5:17	15.3
19	Mon	6:10	19.7		6:13	16.1
20	Tues	6:55	19.5		7:07	17.8
21	Wed	7:37	19.1		8:08	18.7
22	Thur	8:23	18.7		9:12	19.8
23	Fri	9:12	18.3		10:34	20.6
24	Sat	10:04	17.9		11:24	21.2
25	Sun	10:59	17.4			
26	Mon	0:33	21.4		11:56	17.0
27	Tues	1:11	21.4		12:54	18.8
28	Wed	2:27	21.1		1:54	18.2
29	Thur	3:21	20.7		2:57	18.9
30	Fri	4:08	19.6		3:50	19.4
31	Sat	4:49	19.3		4:39	19.3

APPENDIX D. ALASKA BOARD OF FISHERIES REGULATORY ACTION AND MANAGEMENT POLICY CHANGES FOR THE 1985 COMMERCIAL SALMON FISHING SEASON, BRISTOL BAY.

The Alaska Board of Fisheries addressed 84 proposed regulations concerning Bristol Bay at the annual winter Board meeting in November-December of 1984. Board of Fisheries action by major category was as follows:

(a) Boundaries

Total of nine (9) proposals, eight (8) of which were either rejected or no action was taken. A proposal to redefine, by emergency order, the Egegik district outer line with Loran coordinates, and to relocate the inner boundary line near the King Salmon River were adopted.

(b) Seasons

Two (2) proposals to change the opening date(s) of the salmon season were both rejected.

(c) Fishing Periods

Twenty eight (28) proposals were addressed that suggested restricting fishing time during coho season and Sundays, changing dates on the emergency order period, allowing set net gear to begin fishing prior to drift net gear, guaranteed fishing time and resource allocation for set net gear, separate fishery openings by gear type, and changing opening time by tide stage. All proposals were either rejected or no action was taken, except for adoption of a proposal to allow only one gear type to operate if escapement goals would be jeopardized by allowing both gear types to operate.

(d) Gill Net Specification and Operation

Seventeen (17) proposals were included under this category which proposed to increase allowable set net gear and allows hooks and seine leads, decrease both gear types allowable gear by 50%, reduce or eliminate minimum mesh size, change net mesh depth and selvages, and regulate location of set net gear. All proposals were either rejected or no action was taken, except for: (1) the minimum mesh size requirement for sockeye salmon was eliminated and net selvage was redefined; (2) set net permit holders were prohibited from fishing seaward of existing set net sites in the Naknek-Kvichak, Egegik, Ugashik and Togiak districts, except in specified locations of Naknek-Kvichak and Egegik districts; and (3) a proposal was adopted to redefine set net operational methods on the Combine Beach in Nushagak district.

APPENDIX D. (continued)

(e) Minimum Distance Between Gear

Seven (7) proposals addressed separation between set and drift net gear on the offshore end and other "buffer zone" concepts. Eventually, several amended proposals were adopted which established a 100 foot buffer zone on the seaward end of set nets, and required set net anchoring device(s) to be within offshore distance requirements. Exceptions were in a portion of the Naknek section and in the Nushagak district in those areas without offshore restrictions, where differing anchoring requirements were adopted.

(f) Gear/Vessel Identification and Limits

Five (5) proposals were addressed to change set net site identification requirements, require colored stickers for all permit holders, modify vessel identification, and remove vessel length restrictions. All proposals were rejected, except for adoption of a proposal to modify set net marking requirements on Combine Beach in Nushagak district.

(g) Registration and Reregistration

Eleven (11) proposals were related to the district registration process. Proposals were adopted that: provided for a 24 hour waiting period when changing districts and allowing the transferee to fish while waiting 24 hours; require landing fish only in the district in which they were taken; requires initial district registration on a form provided by the Department; ties the registration process to the permit holder as well as the vessel; and ties responsibility for unregistered vessels to the permit holder on board.

(h) Miscellaneous

Six (6) miscellaneous proposals dealing with prohibiting or regulating aircraft salmon spotting; hearing process for escapement goal changes; and EIS requirements prior to mining activities were all rejected.

APPENDIX E. ALASKA BOARD OF FISHERIES REGULATORY ACTION AND MANAGEMENT POLICY CHANGES FOR THE 1985 COMMERCIAL HERRING, SPAWN ON KELP AND CAPELIN FISHING SEASON, BRISTOL BAY.

The Alaska Board of Fisheries adopted the following regulations concerning Bristol Bay herring at the annual winter Board meeting, (November/December 1984):

1. The season ending date was adjusted from June 30 to June 1. (If a late fishery develops, the season ending date will be adjusted by emergency order.)
2. Each gill net in operation must be buoyed at both ends. At least one buoy at each end of the net and at least one cork every 10 fathoms along the cork line must be plainly and legibly marked with the operator's five-digit CFEC permit serial number and the permanent vessel license plate (ADF&G) number of the vessel from which the gill net is operated.
3. No herring purse seine or hand purse seine may exceed 16 fathoms in depth or 150 fathoms in length (depth changed from 850 meshes).
4. Each vessel used to take herring or herring spawn on kelp must display its permanent vessel license plate (ADF&G) number:
 - (a) in permanent symbols at least 12 inches in height and with lines at least one inch in width that contrast with the background;
 - (b) on both sides of the hull or cabin;
 - (c) in a manner such as to be plainly visible and unobscured; and
 - (d) at all times from April 25 to June 1.
5. Capelin carcasses may be disposed of only as follows:
 - (a) any vessel with less than five metric tons of capelin on board may only dump capelin carcasses in water more than five fathoms in depth.
 - (b) any vessel with five metric tons or more of capelin on board may only dump capelin carcasses in water more than three miles from the mainland; or
 - (c) as specified by a permit issued by the Department of Environmental Conservation.
6. As of July 1, 1984 herring stripping and carcass dumping is no longer allowed. However, a bill (Committee substitute for House Bill No. 229) has been filed with the legislature that would again make this practice legal if passed prior to the 1985 season.

Also, the following addition to the present management directive was approved by the Board:

Late season (post-peak) herring openings at Togiak shall be based on one or more of the following criteria:

1. A definable increase in the biomass of herring present on the fishing grounds.
2. A major shift in the age composition of the samples in a definable biomass that is large enough to allow a harvest.
3. A major improvement in the roe maturity of the fish sampled over a broad area, indicating the arrival of a quantity of "New Herring".

Two new regulations concerning the herring spawn on kelp fishery were also passed:

1. Herring spawn may not be taken on transplanted or imported aquatic plants or any other substrate, except for kelp in its natural occurring state. Kelp plants used to take herring spawn may not be suspended from lines, frames, or other man-made devices.
2. Herring spawn on kelp may not be taken with the assistance of underwater breathing apparatus.

